NASA SP-7039(19)
Section 1
Abstracts

NASA PATENT ABSTRACTS BIBLIOGRAPHY

A CONTINUING BIBLIOGRAPHY

Section 1 • Abstracts

JULY 1981

(NASA-SP-7039(19)-Sec-1) NASA PATENT ABSTRACTS BIBLIOGRAPHY: A CONTINUING BIBLIOGRAPHY, SECTION 1, ABSTRACTS. SUPPLEMENT 19 (National Aeronautics and Space Administration) 53 p HC A04/MF A01 00/82 01300

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NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

NASA SP-7039(19) NASA Patent Abstracts Bibliography (Section 1 • Abstracts) JULY 1981

ACCESSION NUMBER RANGES

Bibliography Number	*STAR Accession Numbers*
NASA SP-7039(04)	N69-20701–N73-33931
NASA SP-7039(12)	N74-10001–N77-34042
NASA SP-7039(13)	N78-10001–N78-22018
NASA SP-7039(14)	N78-22019–N78-34034
NASA SP-7039(15)	N79-10001–N79-21993
NASA SP-7039(16)	N79-21994–N79-34158
NASA SP-7039(17)	N80-10001–N80-22254
NASA SP-7039(18)	N80-22255–N80-34339
NASA SP-7039(19)	N81-10001–N81-21997

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NASA SP-7039(19)
Section 1
Abstracts

NASA

PATENT ABSTRACTS BIBLIOGRAPHY

A CONTINUING BIBLIOGRAPHY

Section 1 • Abstracts

Annotated references to NASA-owned inventions covered by U.S. patents and applications for patent that were announced in *Scientific and Technical Aerospace Reports (STAR)* between January 1981 and July 1981.

Scientific and Technical Information Branch JULY 1981
NATIONAL AERONAUTICS AND SPACE ADMINISTRATION
Washington, D.C.

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INTRODUCTION

Several thousand inventions result each year from the aeronautical and space research supported by the National Aeronautics and Space Administration. The inventions having important use in government programs or significant commercial potential are usually patented by NASA. These inventions cover practically all fields of technology and include many that have useful and valuable commercial application.

NASA inventions best serve the interests of the United States when their benefits are available to the public. In many instances, the granting of nonexclusive or exclusive licenses for the practice of these inventions may assist in the accomplishment of this objective. This bibliography is published as a service to companies, firms, and individuals seeking new, licensable products for the commercial market.

The *NASA Patent Abstracts Bibliography (NASA PAB)* is a semiannual NASA publication containing comprehensive abstracts and indexes of NASA-owned inventions covered by U.S. patents and applications for patent. The citations included in *NASA PAB* were originally published in NASA's *Scientific and Technical Aerospace Reports (STAR)* and cover *STAR* announcements made since May 1969.

For the convenience of the user, each issue of *NASA PAB* has a separately bound Abstract Section (Section 1) and Index Section (Section 2). Although each Abstract Section covers only the indicated six-month period, the Index Section is cumulative covering all NASA-owned inventions announced in *STAR* since 1969. Thus a complete set of *NASA PAB* would consist of the Abstract Sections of Issue 04 (January 1974) and Issue 12 (January 1978) and the Abstract Section for all subsequent issues and the Index Section for the most recent issue.

The 130 citations published in this issue of the Abstract Section cover the period January 1981 through July 1981. The Index Section references approximately 4000 citations covering the period May 1969 through July 1981.

ABSTRACT SECTION (SECTION 1)

This *PAB* issue incorporates the 1975 *STAR* category revisions which include 10 major subdivisions divided into 74 specific categories and one general category/division. (See Table of Contents for the scope note of each category under which are grouped appropriate NASA inventions.) This new scheme was devised in lieu of the 34 category divisions which were utilized in *PAB* supplements (01) through (06) covering *STAR* abstracts from May 1969 through January 1974. Each entry in the Abstract Section consists of a *STAR* citation accompanied by an abstract and a key illustration taken from the patent or application for patent drawing. Entries are arranged in subject category in order of the ascending NASA Accession Number originally assigned in *STAR* to the invention. The range of NASA Accession Numbers within each issue is printed on the inside front cover.

Abstract Citation Data Elements: Each of the abstract citations has several data elements useful for identification and indexing purposes, as follows:

NASA Accession Number
NASA Case Number
Inventor's Name

Title of Invention
U.S. Patent Application Serial Number
U.S. Patent Number (for issued patents only)
U.S. Patent Office Classification Number(s)
(for issued patents only)

These data elements in the citation of the abstract as depicted in the Typical Citation and Abstract reproduced below and are also used in the several indexes.

TYPICAL CITATION AND ABSTRACT

NASA SPONSORED DOCUMENT

AVAILABLE ON MICROFICHE

NASA ACCESSION NUMBER

N81-12283*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.

SOURCE

TITLE

BEAM CONNECTOR APPARATUS AND ASSEMBLY Patent Application

INVENTOR

Georg vonTiesenhausen, inventor (to NASA) Filed 8 Oct. 1980
13 p

NASA CASE NUMBER

(NASA-Case-MFS-25134-1; US-Patent-Appl-SN-195226) Avail:
NTIS HC A02/MF A01 CSCL 13B

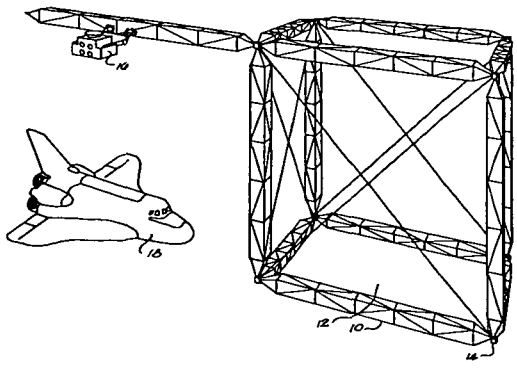
US PATENT APPLICATIONS SERIAL NUMBER

AVAILABILITY

COSATI CODE

ABSTRACT

A connector apparatus and assembly is described for connecting beams and the like structural members which is particularly advantageous for connecting two members together when moved laterally into place. The connector apparatus requires no relative longitudinal movement between the ends of the beams or members being connected to make a connection joint. The connector apparatus includes a receptacle member and a connector housing carried by opposed ends of the structural member being connected wherein a spring-loaded connector member is carried by the connector housing which may be released for extension and engagement into the receptacle member.
NASA



KEY ILLUSTRATION

INDEX SECTION (SECTION 2)

The Index Section is divided into five indexes which are cross-indexed and are useful in locating a single invention or groups of inventions.

Each of the five indexes utilizes basic data elements: (1) Subject Category Number, (2) NASA Accession Number, and (3) NASA Case Number, in addition to other specific index terms.

Subject Index: Lists all inventions according to appropriate alphabetized technical term and indicates the related NASA Case Number, the Subject Category Number, and the NASA Accession Number.

Inventor Index: Lists all inventions according to alphabetized names of inventors and indicates the related NASA Case Number, the Subject Category Number, and the NASA Accession Number.

Source Index: Lists all inventions according to alphabetized source of invention (i.e., name of contractor or government installation where invention was made) and indicates the related NASA Case Number, the Subject Category Number, and the NASA Accession Number.

Number Index: Lists inventions in order of ascending (1) NASA Case Number, (2) U.S. Patent Application Serial Number, (3) U.S. Patent Classification Number, and (4) U.S. Patent Number and indicates the related Subject Category Number and the NASA Accession Number.

Accession Number Index: Lists all inventions in order of ascending NASA Accession Number and indicates the related Subject Category Number, the NASA Case Number, the U.S. Patent Application Serial Number, the U.S. Patent Classification Number, and the U.S. Patent Number.

HOW TO USE THIS PUBLICATION TO IDENTIFY NASA INVENTIONS

To identify one or more NASA inventions within a specific technical field or subject, several techniques are possible when using the flexibility incorporated into the *NASA PAB*.

(1) *Using Subject Category:* To identify all NASA inventions in any one of the subject categories in this issue of *NASA PAB*, select the desired Subject Category in the Abstract Section (Section 1) and find the inventions abstracted thereunder.

(2) *Using Subject Index:* To identify all NASA inventions listed under a desired technical subject index term, (A) turn to the cumulative Subject Index in the Index Section and find the invention(s) listed under the desired technical subject term. (B) Note the indicated Accession Number and the Subject Category Number. (C) Using the indicated Accession Number, turn to the inside front cover of the Index Section to determine which issue of the Abstract Section includes the Accession Number desired. (D) To find the abstract of the particular invention in the issue of the Abstract Section selected, (i) use the Subject Category Number to locate the Subject Category and (ii) use the Accession Number to locate the desired invention within the Subject Category listing.

(3) *Using Patent Classification Index:* To identify all inventions covered by issued NASA patents (does not include applications for patent) within a desired Patent Classification, (A) turn to the Patent Classification Number in the Number Index of Section 2 and find the associated inventions(s), and (B) follow the instructions outlined in (2)(B), and (D) above.

PUBLIC AVAILABILITY OF COPIES OF PATENTS AND PATENT APPLICATIONS

Copies of U.S. patents may be purchased directly from the U.S. Patent and Trademark Office, Washington, D.C. 20231, for fifty cents a copy. When ordering patents, the U.S. Patent Number should be used, and payment must be remitted in advance, preferably by money order or check payable to the Commissioner of Patents and Trademarks. Prepaid purchase coupons for ordering are also available from the Patent and Trademark Office.

NASA *patent application specifications* are sold in paper copy by the National Technical Information Service at price code A02 ($5.00 domestic; $10.00 foreign). Microfiche are sold at price code A01 ($3.50 domestic; $7.00 foreign). The US-Patent-Appl-SN-number should be used in ordering either paper copy or microfiche from NTIS.

LICENSES FOR COMMERCIAL USE: INQUIRIES AND APPLICATIONS FOR LICENSE

NASA inventions, abstracted in *NASA PAB*, are available for nonexclusive or exclusive licensing in accordance with the NASA Patent Licensing Regulations. It is significant that all licenses for NASA inventions shall be by express written instruments and that no license will be granted or implied in a NASA invention except as provided in the NASA Patent Licensing Regulations.

Inquiries concerning the NASA Patent Licensing Program or the availability of licenses for the commercial use of NASA-owned inventions covered by U.S. patents or pending applications for patent should be forwarded to the NASA Patent Counsel of the NASA installation having cognizance of the specific invention, or the Assistant General Counsel for Patent Matters, Code GP-4, National Aeronautics and Space Administration, Washington, D.C. 20546. Inquiries should refer to the NASA Case Number, the Title of the Invention, and the U.S. Patent Number or the U.S. Application Serial Number assigned to the invention as shown in *NASA PAB*.

The NASA Patent Counsel having cognizance of the invention is determined by the first three letters or prefix of the NASA Case Number assigned to the invention. The addresses of NASA Patent Counsels are listed alongside the NASA Case Number prefix letters in the following table. Formal application of license must be submitted on the NASA Form, Application for NASA Patent License, which is available upon request from any NASA Patent Counsel.

NASA Case Number Prefix Letters	Address of Cognizant NASA Patent Counsel
ARC-xxxxx XAR-xxxxx	Ames Research Center Mail Code: 200-11A Moffett Field, California 94035 Telephone: (415)965-5104
ERC-xxxxx XER-xxxxx HQN-xxxxx XHQ-xxxxx	NASA Headquarters Mail Code: GP-4 Washington, D.C. 20546 Telephone: (202)755-3954
GSC-xxxxx XGS-xxxxx	Goddard Space Flight Center Mail Code: 204 Greenbelt, Maryland 20771 Telephone: (301)344-7351
KSC-xxxxx XKS-xxxxx	John F. Kennedy Space Center Mail Code: AA-PAT Kennedy Space Center, Florida 32899 Telephone: (305)867-2544
LAR-xxxxx XLA-xxxxx	Langley Research Center Mail Code: 456 Hampton, Virginia 23365 Telephone: (804)827-3725
LEW-xxxxx XLE-xxxxx	Lewis Research Center Mail Code: 500-311 21000 Brookpark Road Cleveland, Ohio 44135 Telephone: (216)433-6346
MSC-xxxxx XMS-xxxxx	Lyndon B. Johnson Space Center Mail Code: AM Houston, Texas 77058 Telephone: (713)483-4871
MFS-xxxxx XMF-xxxxx	George C. Marshall Space Flight Center Mail Code: CC01 Huntsville, Alabama 35812 Telephone: (205)453-0020
NPO-xxxxx XNP-xxxxx FRC-xxxxx XFR-xxxxx WOO-xxxxx	NASA Resident Legal Office Mail Code: 180-601 4800 Oak Grove Drive Pasadena, California 91103 Telephone: (213)354-2700

PATENT LICENSING REGULATIONS

Title 14—AERONAUTICS AND SPACE

Chapter V—National Aeronautics and Space Administration

PART 1245—PATENTS

Subpart 2—Patent Licensing Regulations

1. Subpart 2 is revised in its entirety as follows:

Sec.

AUTHORITY: The provisions of this Subpart 2 issued under 42 U.S.C. 2457, 2473(b)(3).

§ 1245.200 Scope of subpart.

This Subpart 2 prescribes the terms, conditions, and procedures for licensing inventions covered by U.S. patents and patent applications for which the Administrator of the National Aeronautics and Space Administration holds title on behalf of the United States.

§ 1245.201 Definitions.

For the purpose of this subpart, the following definitions apply:

(a) "Invention" means an invention covered by a U.S. patent or patent application for which the Administrator of NASA holds title on behalf of the United States and which is designated by the Administration as appropriate for the grant of license(s) in accordance with this subpart.

(b) "To practice an invention" means to make or have made, use or have used, sell or have sold, or otherwise dispose of according to law any machine, article of manufacture or composition of matter physically embodying the invention, or to use or have used the process or method comprising the invention.

(c) "Practical application" means the manufacture in the case of a composition of matter or product, the use in the case of a process, or the operation in the case of a machine, under such conditions as to establish that the invention is being utilized and that its benefits are reasonably accessible to the public.

(d) "Special invention" means any invention designated by the NASA Assistant General Counsel for Patent Matters to be subject to short-form licensing procedures. An invention may be designated as a special invention when a determination is made that:

(1) Practical application has occurred and is likely to continue for the life of the patent and for which an exclusive license is not in force, or

(2) The public interest would be served by the expeditious granting of a nonexclusive license for practice of the invention by the public.

(e) The "Administrator" means the Administrator of the National Aeronautics and Space Administration, or his designee.

(f) "Government" means the Government of the United States of America.

(g) The "Inventions and Contributions Board" means the NASA Inventions and Contributions Board established by the Administrator of NASA within the Administration in accordance with section 305 of the National Aeronautics and Space Act of 1958 as amended (42 U.S.C. 2457).

§ 1245.202 Basic considerations.

(a) Much of the new technology resulting from NASA sponsored research and development in aeronautical and space activities has application in other fields. NASA has special authority and responsibility under the National Aeronautics and Space Act of 1958, as amended (42 U.S.C. 2451), to provide for the widest practical dissemination and utilization of this new technology. In addition, NASA has been given unique requirements to protect the inventions resulting from NASA activities and to promulgate licensing regulations to encourage commercial use of these inventions.

(b) NASA-owned inventions will best serve the interests of the United States when they are brought to practical application in the shortest time possible. Although NASA encourages the nonexclusive licensing of its inventions to promote competition and achieve their widest possible utilization, the commercial development of certain inventions calls for a substantial capital investment which private manufacturers may be unwilling to risk under a nonexclusive license. It is the policy of NASA to seek exclusive licensees when such licenses will provide the necessary incentive to the licensee to achieve early practical application of the invention.

(c) The Administrator, in determining whether to grant an exclusive license, will evaluate all relevant information submitted by applicants and all other persons and will consider the necessity for further technical and market development of the invention, the capabilities of prospective licensees, their proposed plans to undertake the required investment and development, the impact on competitors, and the benefits of the license to the Government and to the public. Preference for exclusive license shall be given to U.S. citizens or companies who intend to manufacture or use, in the case of a process, the invention in the United States of America, its territories and possessions. Consideration may also be given to assisting small businesses and minority business enterprises, as well as economically depressed, low income and labor surplus areas.

(d) All licenses for inventions shall be by express written instruments. No license shall be granted either expressly or by implication, for a NASA invention except as provided for in §§ 1245.203 and 1245.204 and in any existing or future treaty or agreement between the United States and any foreign government.

(e) Licenses for inventions covered by NASA-owned foreign patents and patent applications shall be granted in accordance with the NASA Foreign Patent Licensing Regulations (§ 1245.4).

§ 1245.203 Licenses for practical application of inventions.

(a) *General.* As an incentive to encourage practical application of inventions, licenses will be granted to responsible applicants according to the circumstances and conditions set forth in this section.

(b) *Nonexclusive licenses.* (1) Each invention will be made available to responsible applicants for nonexclusive, revocable licensing in accordance with § 1245.206, consistent with the provisions of any existing exclusive license.

(2) The duration of the license shall be for a period as specified in the license.

(3) The license shall require the licensee to achieve the practical application of the invention and to then practice the invention for the duration of the license.

(4) The license may be granted for all or less than all fields of use of the invention and throughout the United States of America, its territories and possessions, Puerto Rico, and the District of Columbia, or in any lesser geographic portion thereof.

(5) The license shall extend to the subsidiaries and affiliates of the licensee and shall be nonassignable without approval of the Administrator, NASA, except to the successor of that part of the licensee's business to which the invention pertains.

(c) *Short-form nonexclusive licenses.* A nonexclusive, revocable license for a special invention, as defined in § 1245.201 (d), shall be granted upon written request, to any applicant by the Patent Counsel of the NASA installation having cognizance of the invention.

(d) *Exclusive licenses.* (1) A limited exclusive license may be granted on an invention available for such licensing provided that:

(i) The Administrator has determined that: (*a*) The invention has not been brought to practical application by a nonexclusive licensee in the fields of use or in the geographical locations covered by the application for the exclusive license, (*b*) practical application of the invention in the fields of use or geographical locations covered by the application for the exclusive license is not likely to be achieved expeditiously by the further funding of the invention by the Government or under a nonexclusive license requested by any applicant pursuant to these regulations, and (c) the exclusive license will provide the necessary incentive to the licensee to achieve the practical application of the invention; and

(ii) Either a notice pursuant to

§ 1245.205 listing the invention as available for licensing has been published in the FEDERAL REGISTER for at least 9 months; or a patent covering the invention has been issued for at least 6 months. However, a limited exclusive license may be granted prior to the periods specified above if the Administrator determines that the public interest will best be served by the earlier grant of an exclusive license.

(2) The license may be granted for all or less than all fields of use of the invention, and throughout the United States of America, its territories and possessions, Puerto Rico, and the District of Columbia, or in any lesser geographic portion thereof.

(3) The exclusive period of the license shall be negotiated, but shall be for less than the terminal portion of the patent, and shall be related to the period necessary to provide a reasonable incentive to invest the necessary risk capital.

(4) The license shall require the licensee to practice the invention within a period specified in the license and then to achieve practical application of the invention.

(5) The license shall require the licensee to expend a specified minimum sum of money and/or to take other specified actions, within indicated period(s) after the effective date of the license, in an effort to achieve practical application of the invention.

(6) The license shall be subject to at least an irrevocable royalty-free right of the Government of the United States to practice and have practiced the invention throughout the world by or on behalf of the Government of the United States and on behalf of any foreign government pursuant to any existing or future treaty or agreement with the United States.

(7) The license may reserve to the Administrator, NASA, under the following circumstances, the right to require the granting of a sublicense to responsible applicant(s) on terms that are considered reasonable by the Administrator, taking into consideration the current royalty rates under similar patents and other pertinent facts: (i) To the extent that the invention is required for public use by Government regulation, or (ii) as may be necessary to fulfill health or safety needs, or (iii) for other purposes stipulated in the license.

(8) The license shall be nontransferable except to the successor of that part of the licensee's business to which the invention pertains.

(9) Subject to the approval of the Administrator, the licensee may grant sublicenses under the license. Each sublicense granted by an exclusive licensee shall make reference to and shall provide that the sublicense is subject to the terms of the exclusive license including the rights retained by the Government under the exclusive license. A copy of each sublicense shall be furnished to the Administrator.

(10) The license may be subject to such other reservations as may be in the public interest.

§ 1245.204 Other licenses.

(a) *License to contractor.* There is hereby granted to the contractor reporting an invention made in the performance of work under a contract of NASA in the manner specified in section 305(a) (1) or (2) of the National Aeronautics and Space Act of 1958 as amended (42 U.S.C. 2457(a) (1) or (2)), a revocable, nonexclusive, royalty-free license for the practice of such invention, together with the right to grant sublicenses of the same scope to the extent the contractor was legally obligated to do so at the time the contract was awarded. Such license and right is nontransferable except to the successor of that part of the contractor's business to which the invention pertains.

(b) *Miscellaneous licenses.* Subject to any outstanding licenses, nothing in this subpart 2 shall preclude the Administrator from granting other licenses for inventions, when he determines that do so would provide for an equitable distribution of rights. The following exemplify circumstances wherein such licenses may be granted:

(1) In consideration of the settlement of an interference;

(2) In consideration of a release of a claim of infringement; or

(3) In exchange for or as part of the consideration for a license under adversely held patent(s).

§ 1245.205 Publication of NASA inventions available for license.

(a) A notice will be perodically published in the FEDERAL REGISTER listing inventions available for licensing. Abstracts of the inventions will also be published in the NASA Scientific and Technical Aerospace Reports (STAR) and other NASA publications.

(b) Copies of pending patent applications for inventions abstracted in STAR may be purchased from the National Technical Information Service, Springfield, Va. 22151.

§ 1245.206 Application for nonexclusive license.

(a) *Submission of application.* An application for nonexclusive license under § 1245.203(b) or a short-form nonexclusive license for special inventions under § 1245.203(c) shall be addressed to the NASA Patent Counsel of the NASA installation having cognizance over the NASA invention for which a license is desired or to the NASA Assistant General Counsel for Patent Matters.

(b) *Contents of an application for nonexclusive license.* An application for nonexclusive license under § 1245.203(b) shall include:

(1) Identification of invention for which license is desired, including the NASA patent case number, patent application serial number of patent number, title and date, if known;

(2) Name and address of the person, company or organization applying for license and whether the applicant is a U.S. citizen or a U.S. corporation;

(3) Name and address of representative of applicant to whom correspondence should be sent;

(4) Nature and type of applicant's business;

(5) Number of employees;

(6) Purpose for which license is desired;

(7) A statement that contains the applicant's best knowledge of the extent to which the invention is being practiced by private industry and the Government;

(8) A description of applicant's capability and plan to undertake the development and marketing required to achieve the practical application of the invention, including the geographical location where the applicant plans to manufacture or use, in the case of a process, the invention; and

(9) A statement indicating the minimum term of years the applicant desires to be licensed.

(c) *Contents of an application for a short-form nonexclusive license.* An application for a short-form nonexclusive license under § 1245.203(c) for a special invention shall include:

(1) Identification of invention for which license is desired, including the NASA patent case number, patent application serial number or patent number, title and date, if known;

(2) Name and address of company or organization applying for license; and

(3) Name and address of representative of applicant to whom correspondence should be sent.

§ 1245.207 Application for exclusive license.

(a) *Submission of application.* An application for exclusive license under § 1245.203(d) may be submitted to NASA at any time. An application for exclusive license shall be addressed to the NASA Assistant General Counsel for Patent Matters.

(b) *Contents of an application for exclusive license.* In addition to the requirements set forth in § 1245.206(b), the application for an exclusive license shall include:

(1) Applicant's status, if any, in any one or more of the following categories:

(i) Small business firm;

(ii) Minority business enterprise;

(iii) Location in a surplus labor area;

(iv) Location in a low-income urban area; and

(v) Location in an area designed by the Government as economically depressed.

(2) A statement indicating the time, expenditure, and other acts which the applicant considers necessary to achieve practical application of the invention, and the applicant's offer to invest that sum and to perform such acts if the license is granted;

(3) A statement whether the applicant would be willing to accept a license for all or less than all fields of use of the invention throughout the United States of America, its territories and possessions, Puerto Rico, and the District of Columbia, or in any lesser geographic portion thereof.

(4) A statement indicating the amount of royalty fees or other consideration, if any, the applicant would be willing to pay the Government for the exclusive license; and

(5) Any other facts which the applicant believes to show it to be in the interests of the United States of America for the Administrator to grant an exclusive license rather than a nonexclusive li-

cense and that such an exclusive license should be granted to the applicant.

§ 1245.208 Processing applications for license.

(a) *Initial review.* Applications for nonexclusive and exclusive licenses under §§ 1245.206 and 1245.207 will be reviewed by the Patent Counsel of the NASA installation having cognizance for the invention and the NASA Assistant General Counsel for Patent Matters, to determine the conformity and appropriateness of the application for license and the availability of the specific invention for the license requested. The Assistant General Counsel for Patent Matters will forward all applications for license conforming to §§ 1245.206(b) and 1245.207(b) to the NASA Inventions and Contributions Board when the invention is available for consideration of the requested license. Prior to forwarding applications for exclusive licenses to the Inventions and Contributions Board, notice in writing will be given to each nonexclusive licensee for the specific invention advising of the receipt of the application for the exclusive license and providing each nonexclusive licensee with a 30-day period for submitting either evidence that practical application of the invention has occurred or is about to occur or, an application for an exclusive license for the invention.

(b) *Recommendations of Inventions and Contributions Board.* The Inventions and Contributions Board shall, in accordance with the basic considerations set forth in §§ 1245.202 and 1245.203, evaluate all applications for license forwarded by the Assistant General Counsel for Patent Matters. Based upon the facts presented to the Inventions and Contributions Board in the application and any other facts in its possession, the Inventions and Contributions Board shall recommend to the Administrator: (1) Whether a nonexclusive or exclusive license should be granted, (2) the identity of the licensee, and (3) any special terms or conditions of the license.

(c) *Determination of Administrator and grant of nonexclusive licenses.* The Administrator shall review the recommendations of the Inventions and Contributions Board and shall determine whether to grant the nonexclusive license as recommended by the Board. If the Administrator determines to grant the license, the license will be granted upon the negotiation of the appropriate terms and conditions of the Office of General Counsel.

(d) *Determination of Administrator and grant of exclusive licenses*—(1) *Notice.* If the Administrator determines that the best interest of the United States will be served by the granting of an exclusive license in accordance with the basic considerations set forth in §§ 1245.202 and 1245.203, a notice shall be published in the FEDERAL REGISTER announcing the intent to grant the exclusive license, the identification of the invention, special terms or conditions of the proposed license, and a statement that NASA will grant the exclusive license unless within 30 days of the publication of such notice the Inventions and Contributions Board receives in writing any of the following together with supporting documentation:

(i) A statement from any person setting forth reasons why it would not be in the best interest of the United States to grant the proposed exclusive license; or

(ii) An application for a nonexclusive license under such invention, in accordance with § 1245.206(b), in which applicant states that he has already brought or is likely to bring the invention to practical application within a reasonable period.

The Inventions and Contributions Board shall, upon receipt of a written request within the 30 days' notice period, grant an extension of 30 days for the submission of the documents designated above.

(2) *Recommendation of Inventions and Contributions Board.* Upon the expiration of the period required by subparagraph (1) of this paragraph, the Board shall review all written responses to the notice and shall then recommend to the Administrator whether to grant the exclusive license as the Board initially recommended or whether a different form of license, if any, should instead be granted.

(3) *Grant of exclusive licenses.* The Administrator shall review the Board's recommendation and shall determine if the interest of the United States would best be served by the grant of an exclusive license as recommended by the Board. If the Administrator determines to grant the exclusive license, the license will be granted upon the negotiation of the appropriate terms and conditions by the Office of General Counsel.

§ 1245.209 Royalties and fees.

(a) Normally, a nonexclusive license for the practical application of an invention granted to a U.S. citizen or company will not require the payment of royalties; however, NASA may require other consideration.

(b) An exclusive license for an invention may require the payment of royalties, fees or other consideration when the licensing circumstances and the basic considerations in § 1245.202, considered together, indicate that it is in the public interest to do so.

§ 1245.210 Reports.

A license shall require the licensee to submit periodic reports of his efforts to work the invention. The reports shall contain information within his knowledge, or which he may acquire under normal business practice, pertaining to the commercial use that is being made of the invention and such other information which the Administrator may determine pertinent to the licensing program and which is specified in the license.

§ 1245.211 Revocation of licenses.

(a) Any license granted pursuant to § 1245.203 may be revoked, either in part or in its entirety, by the Administrator if in his opinion the licensee at any time shall fail to use adequate efforts to bring to or achieve practical application of the invention in accordance with the terms of the license, or if the licensee at any time shall default in making any report required by the license, or shall make any false report, or shall commit any breach of any covenant or agreement therein contained, and shall fail to remedy any such default, false report, or breach within 30 days after written notice, or if the patent is deemed unenforceable either by the Attorney General or a final decision of a U.S. court.

(b) Any license granted pursuant to § 1245.204(a) may be revoked, either in part or in its entirety, by the Administrator if in his opinion such revocation is necessary to achieve the earliest practical application of the invention pursuant to an application for exclusive license submitted in accordance with § 1245.207, or the licensee at any time shall breach any covenant or agreement contained in the license, and shall fail to remedy any such breach within 30 days after written notice thereof.

(c) Before revoking any license granted pursuant to this Subpart 2 for any cause, there will be furnished to the licensee a written notice of intention to revoke the license, and the licensee will be allowed 30 days after such notice in which to appeal and request a hearing before the Inventions and Contributions Board on the question of revocation. After a hearing, the Inventions and Contributions Board shall transmit to the Administrator the record of proceedings, its findings of fact, and its recommendation whether the license should be revoked either in part or in its entirety. The Administrator shall review the recommendation of the Board and determine whether to revoke the license in part or in its entirety. Revocation of a license shall include revocation of all sublicenses which have been granted.

§ 1245.212 Appeals.

Any person desiring to file an appeal pursuant to § 1245.211(c) shall address the appeal to Chairman, Inventions and Contributions Board. Any person filing an appeal shall be afforded an opportunity to be heard before the Inventions and Contributions Board, and to offer evidence in support of his appeal. The procedures to be followed in any such matter shall be determined by the Administrator. The Board shall make findings of fact and recommendations with respect to disposition of the appeal. The decision on the appeal shall be made by the Administrator, and such decision shall be final and conclusive, except on questions of law, unless determined by a court of competent jurisdiction to have been fraudulent, or capricious, or arbitrary, or so grossly erroneous as necessarily to imply bad faith, or not supported by substantial evidence.

§ 1245.213 Litigation.

An exclusive licensee shall be granted the right to sue at his own expense any party who infringes the rights set forth in his license and covered by the licensed patent. The licensee may join the Government, upon consent of the Attorney General, as a party complainant in such suit, but without expense to the Government and the licensee shall pay costs and any final judgment or decree that may be rendered against the Govern-

ment in such suit. The Government shall also have an absolute right to intervene in any such suit at its own expense. The licensee shall be obligated to promptly furnish to the Government, upon request, copies of all pleadings and other papers filed in any such suit and of evidence adduced in proceedings relating to the licensed patent including, but not limited to, negotiations for settlement and agreements settling claims by a licensee based on the licensed patent, and all other books, documents, papers, and records pertaining to such suit. If, as a result of any such litigation, the patent shall be declared invalid, the licensee shall have the right to surrender his license and be relieved from any further obligation thereunder.

§ 1245.214 Address of communications.

(a) Communications to the Assistant General Counsel for Patent Matters in accordance with §§ 1245.206 and 1245.207 and requests for information concerning licenses for NASA inventions should be addressed to the Assistant General Counsel for Patent Matters, Code GP, National Aeronautics and Space Administration, Washington, D.C. 20546.

(b) Communications to the Inventions and Contributions Board in accordance with §§ 1245.208, 1245.211, and 1245.212 should be addressed to Chairman, Inventions and Contributions Board, National Aeronautics and Space Administration, Washington, D.C. 20546.

Effective date. The regulations set forth in this subpart 2 are effective April 1, 1972.

JAMES C. FLETCHER,
Administrator.

FOREIGN PATENT LICENSING REGULATIONS

Selected NASA inventions are also available for licensing in countries other than the United States in accordance with the NASA Foreign Patent Licensing Regulation (14 C.F.R. 1245.4), a copy of which is available from any NASA Patent Counsel. For abstracts of NASA-owned inventions available for licensing in countries other than the United States, see NASA SP-7038, "Significant NASA Inventions available for Licensing in Countries Other Than the United States." A copy of this NASA publication is available from NASA Headquarters, Code GP-4, Washington, D.C., 20546.

TABLE OF CONTENTS

Section 1 • Abstracts

AERONAUTICS

Includes aeronautics (general); aerodynamics; air transportation and safety; aircraft communications and navigation; aircraft design, testing and performance; aircraft instrumentation; aircraft propulsion and power; aircraft stability and control; and research and support facilities (air).

For related information see also *Astronautics*.

ASTRONAUTICS

Includes astronautics (general); astrodynamics; ground support systems and facilities (space); launch vehicles and space vehicles; space transportation; spacecraft communications, command and tracking; spacecraft design, testing and performance; spacecraft instrumentation; and spacecraft propulsion and power.

For related information see also *Aeronautics*.

CHEMISTRY AND MATERIALS

Includes chemistry and materials (general); composite materials; inorganic and physical chemistry; metallic materials; nonmetallic materials; and propellants and fuels.

ENGINEERING

Includes engineering (general); communications; electronics and electrical engineering; fluid mechanics and heat transfer; instrumentation and photography; lasers and masers; mechanical engineering; quality assurance and reliability; and structural mechanics.
For related information see also *Physics.*

GEOSCIENCES

Includes geosciences (general); earth resources; energy production and conversion; environment pollution; geophysics; meteorology and climatology; and oceanography.
For related information see also *Space Sciences.*

LIFE SCIENCES

Includes life sciences (general); aerospace medicine; behavioral sciences; man/system technology and life support; and planetary biology.

MATHEMATICAL AND COMPUTER SCIENCES

Includes mathematical and computer sciences (general); computer operations and hardware; computer programming and software; computer systems; cybernetics; numerical analysis; statistics and probability; systems analysis; and theoretical mathematics.

PHYSICS

Includes physics (general); acoustics; atomic and molecular physics; nuclear and high-energy physics; optics; plasma physics; solid-state physics; and thermodynamics and statistical physics.
For related information see also *Engineering.*

Note: N.A. means that no abstracts were assigned to this category for this issue.

Section 2 • Indexes

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NASA Patent Abstracts Bibliography

A Semiannual Publication of the National Aeronautics and Space Administration

02 AERODYNAMICS

Includes aerodynamics of bodies, combinations, wings, rotors, and control surfaces; and internal flow in ducts and turbomachinery.

For related information see also *34 Fluid Mechanics and Heat Transfer.*

N81-14967* National Aeronautics and Space Administration. John F. Kennedy Space Center, Cocoa Beach, Fla.

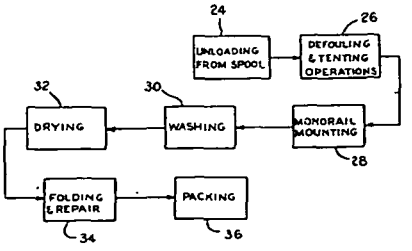
SYSTEM FOR REFURBISHING AND PROCESSING PARACHUTES Patent

Russell T. Crowell, inventor (to NASA) Issued 30 Sep. 1980 8 p Filed 21 Dec. 1977 Supersedes N78-22026 (16 - 13, p 1654)

(NASA-Case-KSC-11042-1; US-Patent-4,224,810; US-Patent-Appl-SN-862878; US-Patent-Class-68-3R) Avail: US Patent and Trademark Office CSCL 13H

A method for refurbishing and processing parachutes is disclosed including an overhead monorail conveyor system on which the parachute is suspended for horizontal conveyance. The parachute is first suspended in partially open tented configuration wherein open inspection of the canopy is permitted. The parachute is transported by the monorail conveyor to a washing and drying station. Following drying of the parachute, the parachute is conveyed into an interior space where it is finally inspected and removed from the monorail conveyor and laid upon a table for folding. Following folding operations, the parachute is once again mounted on the conveyor in an elongated horizontal configuration and conveyed to a packing area for stowing the parachute in a deployment bag.

Official Gazette of the U.S. Patent and Trademark Office



N81-14968* National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

AERODYNAMIC SIDE-FORCE ALLEVIATOR MEANS Patent

Dhanvada M. Rao, inventor (Old Dominion Univ.) Issued 30 Sep. 1980 7 p Filed 12 Mar. 1979 Supersedes N79-17813 (17 - 09, p 1072) Sponsored by NASA

(NASA-Case-LAR-12326-1; US-Patent-4,225,102; US-Patent-Appl-SN-019541; US-Patent-Class-244-130; US-Patent-Class-102-56R; US-Patent-Class-102-92.1; US-Patent-Class-244-119) Avail: US Patent and Trademark Office CSCL 01A

An apparatus for alleviating high angle of attack side force on slender pointed cylindrical forebodies such as fighter aircraft, missiles and the like is described. A symmetrical pair of helical separation trips was employed to disrupt the leeside vortices normally attained. The symmetrical pair of trips starts at either a common point or at space points on the upper surface of the forebody and extends along separate helical paths along the circumference of the forebody.

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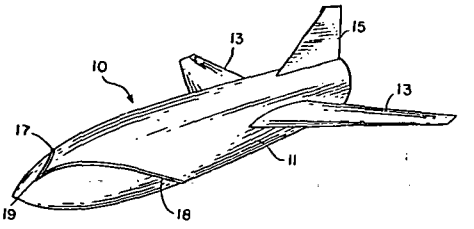


N81-19016*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

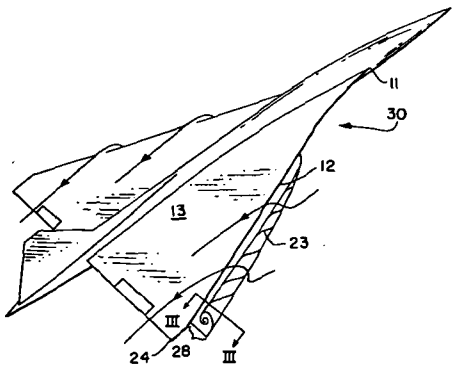
LEADING EDGE VORTEX FLAPS FOR DRAG REDUCTION Patent Application

Dhanvada M. Rao, inventor (to NASA) (Old Dominion Univ.) Filed 26 Nov. 1980 12 p Sponsored by NASA

(NASA-Case-LAR-12750-1; US-Patent-Appl-SN-210491) Avail: NTIS HC A02/MF A01 CSCL 01A

A leading edge flap system to control the coiled vortex formation on highly swept slender wings designed for supersonic flight is disclosed. The vortex flap is positioned forward of, and at an angle downward from, the leading edge of the wings. It is retracted beneath the wings during supersonic flight. Flow separation occurs on the highly deflected vortex flap creating a coiled vortex on the vortex flap surface. The suction of the coiled vortex produces an aerodynamic thrust component. The

pitch up and lateral stability problem associated with coiled vortex formation on the wing surface are reduced. Segmented flaps with independent adjustment allow optimum flow conditions to be closely approximated. NASA



04 AIRCRAFT COMMUNICATIONS AND NAVIGATION

Includes digital and voice communication with aircraft; air navigation systems (satellite and ground based); and air traffic control.

For related information see also *17 Spacecraft Communications, Command, and Tracking* and *32 Communications*.

N81-21047* National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.

AUTONOMOUS NAVIGATION SYSTEM Patent

Shmuel J. Merhav, inventor (to NASA) (NAS-NRC, Washington, D.C.) Issued 13 Jan. 1981 19 p Filed 24 Sep. 1979 Supersedes N79-33177 (17 - 24, p 3174) Sponsored by NASA (NASA-Case-ARC-11257-1; US-Patent-4,244,215; US-Patent-Appl-SN-078611; US-Patent-Class-73-178R; US-Patent-Class-73-490; US-Patent-Class-73-504) Avail: US Patent and Trademark Office CSCL 17G

An *inertial navigation system utilizing a servo-controlled two* degree of freedom pendulum to obtain specific force components in the locally level coordinate system is described. The pendulum includes a leveling gyroscope and an azimuth gyroscope supported on a two gimbal system. The specific force components in the locally level coordinate system are converted to components in the geographical coordinate system by means of a single Euler transformation. The standard navigation equations are solved to determine longitudinal and lateral velocities. Finally, vehicle position is determined by a further integration.

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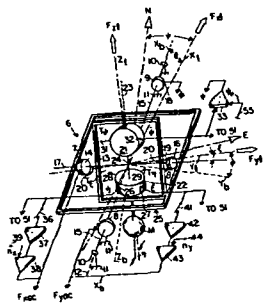

05 AIRCRAFT DESIGN, TESTING AND PERFORMANCE

Includes aircraft simulation technology.

For related information see also *18 Spacecraft Design, Testing and Performance* and *39 Structural Mechanics*.

N81-19087* National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

COMPENSATING LINKAGE FOR MAIN ROTOR CONTROL Patent

Philip A. E. Jeffery (United Aircraft Corp., Stratford, Conn.) and Rudolf F. Huber, inventors (to NASA) (United Aircraft Corp., Stratford, Conn.) Issued 20 Jan. 1981 6 p Filed 25 Dec. 1978 Supersedes N79-15057 (17 - 06, p 0694) Sponsored by NASA (NASA-Case-LAR-11797-1; US-Patent-4,245,956; US-Patent-Appl-SN-969755; US-Patent-Class-416-114; US-Patent-Class-244-17.25; US-Patent-Class-416-500; US-Patent-Class-74-519) Avail: US Patent and Trademark Office CSCL 01C

A compensating linkage for the rotor control system on rotary wing aircraft is described. The main rotor and transmission are isolated from the airframe structure by elastic suspension. The compensating linkage prevents unwanted signal inputs to the rotor control system caused by relative motion of the airframe structure and the main rotor and transmission.

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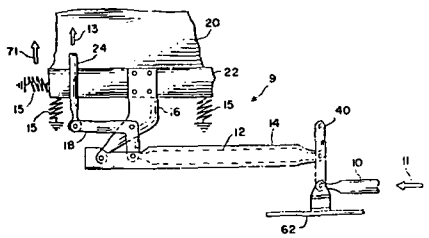

06 AIRCRAFT INSTRUMENTATION

Includes cockpit and cabin display devices; and flight instruments.

For related information see also *19 Spacecraft Instrumentation* and *35 Instrumentation and Photography*.

N81-17057* National Aeronautics and Space Administration. Hugh L. Dryden Flight Research Center, Edwards, Calif.

SKIN FRICTION MEASURING DEVICE FOR AIRCRAFT Patent

Lawrence C. Montoya and Donald R. Bellman, inventors (to NASA) Issued 23 Dec. 1980 8 p Filed 7 Aug. 1979 Supersedes N79-31139 (17 - 22, p 2895) (NASA-Case-FRC-11029-1; US-Patent-4,240,290; US-Patent-Appl-SN-164617; US-Patent-Class-73-178R; US-Patent-Class-73-147) Avail: US Patent and Trademark Office CSCL 01D

A skin friction measuring device for measuring the resistance of an aerodynamic surface to an airstream is described. It was adapted to be mounted on an aircraft and is characterized by a friction plate adapted to be disposed in a flush relationship with the external surface of the aircraft and be displaced in response to skin friction drag. As an airstream is caused to flow over the

surface, a potentiometer connected to the plate for providing an electrical output indicates the magnitude of the drag.

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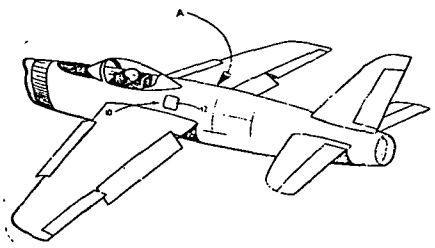

07 AIRCRAFT PROPULSION AND POWER

Includes prime propulsion systems and systems components, e.g., gas turbine engines and compressors; and on-board auxiliary power plants for aircraft.

For related information see also *20 Spacecraft Propulsion and Power, 28 Propellants and Fuels,* and *44 Energy Production and Conversion.*

N81-14999* National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

CURVED CENTERLINE AIR INTAKE FOR A GAS TURBINE ENGINE Patent

William C. Ruehr (GE, Cincinnati), James L. Younghans (GE, Cincinnati), and Edwin B. Smith, inventors (to NASA) (GE, Cincinnati) Issued 2 Sep. 1980 6 p Filed 14 May 1979 Sponsored by NASA

(NASA-Case-LEW-13201-1; US-Patent-4,220,171; US-Patent-Appl-SN-038980; US-Patent-Class-137-15.1; US-Patent-Class-181-214) Avail: US Patent and Trademark Office CSCL 21E

An inlet for a gas turbine engine was disposed about a curved centerline for the purpose of accepting intake air that is flowing at an angle to engine centerline and progressively turning that intake airflow along a curved path into alignment with the engine. This curved inlet is intended for use in under the wing locations and similar regions where airflow direction is altered by aerodynamic characteristics of the airplane. By curving the inlet, aerodynamic loss and acoustic generation and emission are decreased.

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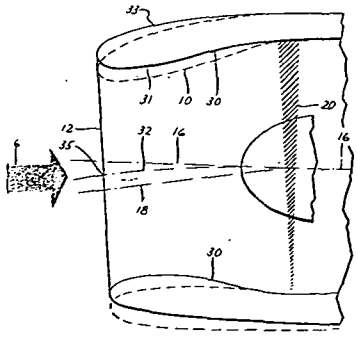

N81-19115* National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

APPARATUS FOR SENSOR FAILURE DETECTION AND CORRECTION IN A GAS TURBINE ENGINE CONTROL SYSTEM Patent

Henry A. Spang, III (GE, Cincinnati) and Robert P. Wanger, inventors (to NASA) (GE, Cincinnati) Issued 3 Feb. 1981 14 p Filed 24 May 1978 Continuation in part of abandoned US Patent Appl. SN-752050, filed 20 Dec. 1976 Sponsored by NASA

(NASA-Case-LEW-12907-2; US-Patent-4,249,238; US-Patent-Appl-SN-909235; US-Patent-Appl-SN-752050; US-Patent-Class-364-106; US-Patent-Class-60-39.24; US-Patent-Class-364-431) Avail: US Patent and Trademark Office CSCL 21E

A gas turbine engine control system maintains a selected level of engine performance despite the failure or abnormal operation of one or more engine parameter sensors. The control system employs a continuously updated engine model which simulates engine performance and generates signals representing real time estimates of the engine parameter sensor signals. The estimate signals are transmitted to a control computational unit which utilizes them in lieu of the actual engine parameter sensor signals to control the operation of the engine. The estimate signals are also compared with the corresponding actual engine parameter sensor signals and the resulting difference signals are utilized to update the engine model. If a particular difference signal exceeds specific tolerance limits, the difference signal is inhibited from updating the model and a sensor failure indication is provided to the engine operator.

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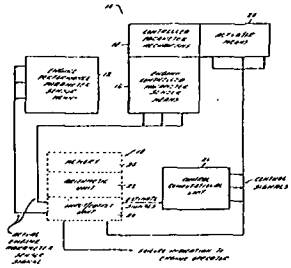

N81-19116* National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

INTEGRATED CONTROL SYSTEM FOR A GAS TURBINE ENGINE Patent

Jack E. Cornett (GE, Cincinnati), Andrew A. Saunders, Jr. (GE, Cincinnati), Ira E. Marvin (GE, Cincinnati), and Richard S. Beitler, inventors (to NASA) (GE, Cincinnati) Issued 6 Jan. 1981 10 p Filed 25 May 1978 Continuation in part of abandoned US Patent Appl. SN-741056, filed 11 Nov. 1976 Sponsored by NASA

(NASA-Case-LEW-12594-2; US-Patent-4,242,864; US-Patent-Appl-SN-909608; US-Patent-Appl-SN-741056; US-Patent-Class-60-226R; US-Patent-Class-60-236; US-Patent-Class-60-238; US-Patent-Class-60-239) Avail: US Patent and Trademark Office CSCL 21E

A control system for a turbofan engine receives signals from a number of engine sensors and from the engine operator, and generates control signals. One control signal regulates the fan exhaust nozzle area in order to control inlet throat Mach number to maintain a low level of engine noise. Additional control signals regulate fuel flow to control engine thrust and fan pitch to control fan speed. A number of schedules are utilized to maintain a

predetermined relationship between the controlled parameters and a number of fixed and calculated limits can override the control signals to prevent unsatisfactory engine performance.
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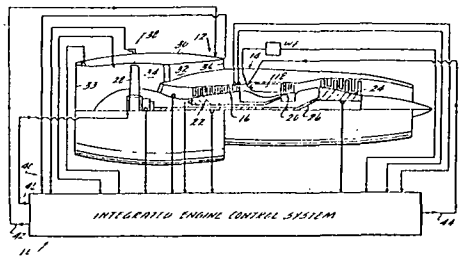
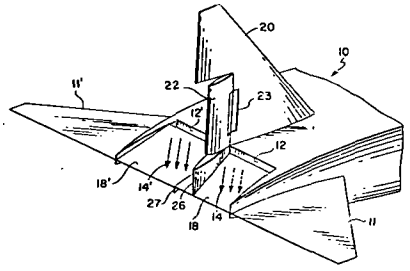


08 AIRCRAFT STABILITY AND CONTROL

Includes aircraft handling qualities; piloting; flight controls; and autopilots.

N81-19130* National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
THRUST AUGMENTED SPIN RECOVERY DEVICE Patent
Bobby L. Berrier, inventor (to NASA) Issued 2 Dec. 1980 6 p Filed 27 Apr. 1979 Supersedes N80-18048 (18 - 09, p 1095) Continuation of US Patent Appl. SN-272503, filed 28 Sep. 1976
(NASA-Case-LAR-11970-2; US-Patent-4,236,684; US-Patent-Appl-SN-034104; US-Patent-Appl-SN-727503; US-Patent-Class-244-52; US-Patent-Class-244-87; US-Patent-Class-244-12.5) Avail: US Patent and Trademark Office CSCL 01C

Yaw control surfaces were developed for a jet propelled aircraft. A thrust augmented rudder is disposed above the jet exhaust stream and a thrust rudder tab extends downward into the jet exhaust stream. These components are cooperatively deflected to generate yawing moments for directional control of the aircraft. T.M.



16 SPACE TRANSPORTATION

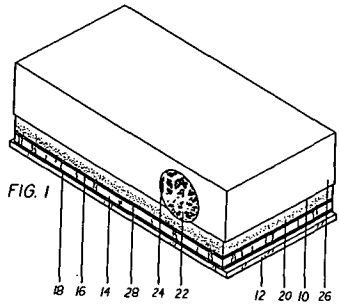
Includes passenger and cargo space transportation e.g., shuttle operations; and rescue techniques.

For related information see also *03 Air Transportation and Safety* and *85 Urban Technology and Transportation.*

N81-16110*# National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.

IMPROVED ATTACHMENT SYSTEM FOR SILICA TILES Patent Application
Robert L. Dotts and Jack W. Holt, inventors (to NASA) (Rockwell International Corp., Downey, Calif.) Filed 17 Dec. 1980 16 p (NASA-Case-MSC-18741-1; US-Patent-Appl-SN-217336) Avail: NTIS HC A02/MF A01 CSCL 22B

The bond strength between a rigid, porous refractory material and a nonrigid substrate is markedly increased by densifying the face of the rigid material opposing the substrate. Densification is accomplished by wetting the refractory material and then impregnating it with a composite slurry having a particle size to fill voids of the porous material. NASA



18 SPACECRAFT DESIGN, TESTING AND PERFORMANCE

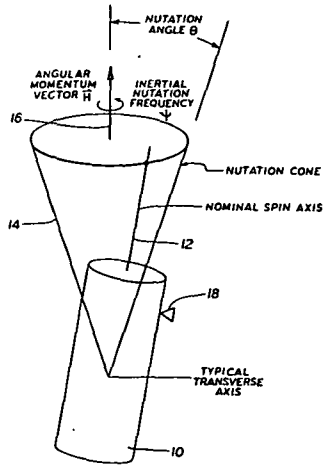
Includes spacecraft thermal and environmental control; and attitude control.

For life support systems see *54 Man/System Technology and Life Support.* For related information see also *05 Aircraft Design, Testing and Performance* and *39 Structural Mechanics.*

N81-12156*# National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
METHOD OF AND APPARATUS FOR DAMPING NUTATION MOTION WITH MINIMUM SPIN AXIS ATTITUDE DISTURBANCE Patent Application
Henry C. Hoffman, inventor (to NASA) Filed 29 Aug. 1980 21 p
(NASA-Case-GSC-12551-1; US-Patent-Appl-SN-182881) Avail: NTIS HC A02/MF A01 CSCL 22B

A method for damping nutation of a spinning spacecraft is described. The spin axis attitude disturbances were substantially reduced by controlling at least one nutation damping gas thruster to fire with nonuniform gas pulses. During the beginning of a nutation control sequence, the duration of successive gas pulses was gradually increased from zero to a predetermined maximum duration. The duration of successive pulses was then maintained constant for a time period. At the end of the nutation

control sequence, the duration of successive gas pulses was gradually reduced to zero. NASA

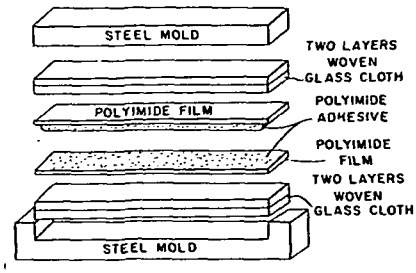


24 COMPOSITE MATERIALS

Includes laminates.

N81-12174*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
PROCESS FOR PREPARING HIGH TEMPERATURE POLYIMIDE FILM LAMINATES Patent Application
Anne K. St.Clair and Terry L. St.Clair, inventors (to NASA) Filed 22 Sep. 1980 17 p
(NASA-Case-LAR-12742-1; US-Patent-Appl-SN-189234) Avail: NTIS HC A02/MF A01 CSCL 11D

A process for fabricating large area void-free polyimide laminate structures wherein multiple ply polyimide film laminates may be constructed without decreasing the individual film strength is described. Layers of metal foil may be laminated between polyimide film layers to yield a flexible high temperature resistant structure having capabilities for use as flexible electric circuits in aerospace applications. NASA



N81-13999* National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
STRUCTURAL WOOD PANELS WITH IMPROVED FIRE RESISTANCE Patent
Paul M. Sawko, Inventor (to NASA) Issued 24 Jun. 1980 4 p Filed 28 Jul. 1978 Supersedes N78-28178 (16-19, p 2498)
(NASA-Case-ARC-11174-1; US-Patent-4,209,561; US-Patent-Appl-SN-929086; US-Patent-Class-428-114; US-Patent-Class-260-17.2; US-Patent-Class-428-528; US-Patent-Class-428-541; US-Patent-Class-428-921) Avail: US Patent and Trademark Office CSCL 11L

Structural wood paneling or other molded wood compositions consisting of finely divided wood chips, flour, or strands are bound together and hot pressed with a modified novolac resin which is the cured product of a prepolymer made from an aralkyl ether or halide with a phenol and a hardening agent such as hexamethylene tetramine. The fire resistance of these articles is further improved by incorporating in the binder certain inorganic fillers, especially a mixture of ammonium oxalate and ammonium phosphate..

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N81-14000* National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
PARTIAL INTERLAMINAR SEPARATION SYSTEM FOR COMPOSITES Patent
Wolf Elber, inventor (to NASA) Issued 21 Oct. 1980 5 p Filed 24 Mar. 1978 Supersedes N78-22162 (16-13, p 1675)
(NASA-Case-LAR-12065-1; US-Patent-4,229,473; US-Patent-Appl-SN-889671; US-Patent-Class-428-113; US-Patent-Class-156-330; US-Patent-Class-428-114; US-Patent-Class-428-140; US-Patent-Class-428-413; US-Patent-Class-428-480; US-Patent-Class-428-902) Avail: US Patent and Trademark Office CSCL 11D

This inventor relates to an interlaminar separation system for composites wherein a thin layer of a perforated foil film is interposed between adjacent laminae of a composite formed from prepreg tapes to thereby permit laminate adherence through the perforations and produce a composite structure having improved physical property characteristics.

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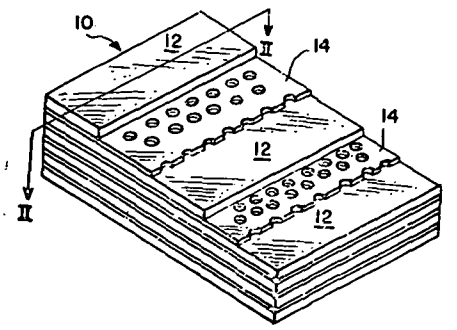
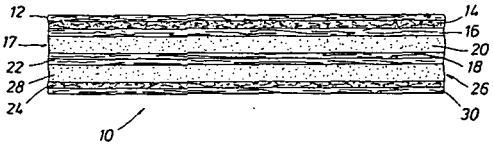


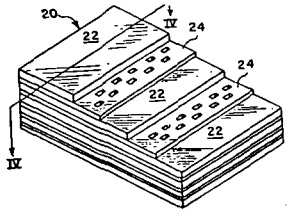
N81-16127*# National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.
ABSORBENT PRODUCT AND ARTICLES MADE THEREFROM Patent Application
James V. Correale and Frederic S. Dawn, inventors (to NASA) Filed 24 Dec. 1980 14 p
(NASA-Case-MSC-18223-1; US-Patent-Appl-SN-219681) Avail: NTIS HC A02/MF A01 CSCL 11G

A multilayer absorbent product is described for use in contact with the skin to absorb fluids, the product having a water pervious facing layer for contacting the skin, a first fibrous wicking layer overlaying the water pervious layer, a first container section defined by inner and outer layers of a water pervious wicking material between which is disposed a first absorbent mass, a second container section defined by inner and outer layers of a water pervious wicking material between what is disposed a second absorbent mass and a liquid impermeable/gas permeable layer overlaying the second fibrous wicking layer. NASA



N81-16128*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
PARTIAL INTERLAMINAR SEPARATION SYSTEM FOR COMPOSITES Patent Application
Wolf Elber, inventor (to NASA) Filed 7 Feb. 1980 12 p
(NASA-Case-LAR-12065-2; US-Patent-Appl-SN-119337) Avail: NTIS HC A02/MF A01 CSCL 11D

An interlaminar separation system for composites is described wherein a thin layer of a perforated foil film is interposed between adjacent laminae of a composite formed from prepreg tapes to thereby permit laminae adherence through the perforations and produce a composite structure having improved physical property characteristics. NASA



N81-17170* National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
METHOD FOR ALLEVIATING THERMAL STRESS DAMAGE IN LAMINATES Patent
Charles A. Hoffman, John W. Weeton, and Norman W. Orth, inventors (to NASA) Issued 8 Jul. 1980 6 p Filed 6 Apr. 1978 Supersedes N78-22163 (16 - 13, p 1675)
(NASA-Case-LEW-12493-1; US-Patent-4,211,354; US-Patent-Appl-SN-893857; US-Patent-Class-228-118; US-Patent-Class-228-170; US-Patent-Class-228-174; US-Patent-Class-228-190; US-Patent-Class-156-292) Avail: US Patent and Trademark Office CSCL 11D

A method is provided for alleviating the stress damage in metallic matrix composites, such as laminated sheet or foil composites. Discontinuities are positively introduced into the interface between the layers so as to reduce the thermal stress produced by unequal expansion of the materials making up the composite. Although a number of discrete elements could be used to form one of the layers and thus carry out this purpose, the discontinuities are preferably produced by simply drilling holes in the metallic matrix layer or by forming grooves in a grid pattern in this layer.

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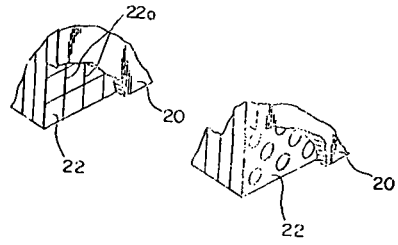
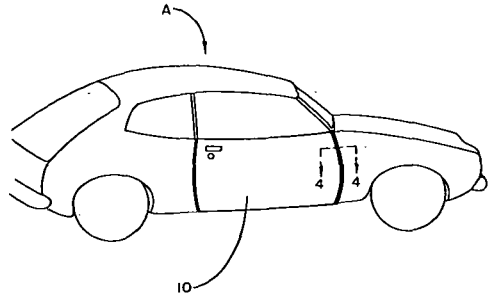


N81-19230*# National Aeronautics and Space Administration. Pasadena Office, Calif.
FIBERGLASS/EPOXY COMPOSITE AUTOMOTIVE DOOR STRUCTURE INCLUDING A GLASS-REINFORCED INTRUSION STRIP Patent Application
Jerome L. Bauer, Jr., Inventor (to NASA) (JPL) Filed 19 Feb. 1981 20 p
(NASA-Case-NPO-15057-1; US-Patent-Appl-SN-235887) Avail: NTIS HC A02/MF A01 CSCL 11D

A lightweight, composite outer door panel for a vehicle and a method for forming it are presented. The door is characterized by a molded outer panel having an integral comolded intrusion strip extended along one surface thereof, said outer panel being formed of a sheet molding compound consisting essentially of chopped glass fibers randomly dispersed in a polyester resin and said intrusion strip being formed of a material consisting essentially of continuous glass fibers, and a pair of mutually spaced hinge brackets bonded to the intrusion strip near one end thereof and a latch bracket bonded to the strip near the other end thereof, said brackets being imployed for imparting fixity to the opposite ends of said intrusion strip. NASA



25 INORGANIC AND PHYSICAL CHEMISTRY

Includes chemical analysis, e.g., chromatography; combustion theory; electrochemistry; and photochemistry.

For related information see also *77 Thermodynamics and Statistical Physics*.

N81-14015* National Aeronautics and Space Administration. Pasadena Office, Calif.

STARK CELL OPTOACOUSTIC DETECTION OF CONSTITUENT GASES IN SAMPLE Patent

Jack S. Margolis (JPL) and Michael S. Shumate, inventors (to NASA) (JPL) Issued 18 Nov. 1980 7 p Filed 31 Aug. 1978 Supersedes N79-10169 (17-01, p 0023) Sponsored by NASA

(NASA-Case-NPO-14143-1; US-Patent-4,234,258; US-Patent-Appl-SN-938297; US-Patent-Class-356-437; US-Patent-Class-250-343) Avail: US Patent and Trademark Office CSCL 07D

An optoacoustic detector for gas analysis is implemented with Stark effect cell modulation for switching a beam in and out of coincidence with a spectral line of a constituent gas in order to eliminate the heating effect of laser energy in the cell as a source of background noise. By using a multiline laser, and linearly sweeping the dc bias voltage while exciting the cell with a multiline laser, it is possible to obtain a spectrum from which to determine the combinations of excited constituents and determine their concentrations in parts per million.

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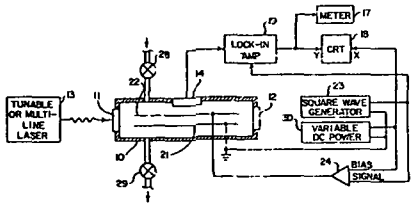


N81-14016* National Aeronautics and Space Administration. *Ames Research Center, Moffett Field, Calif.*

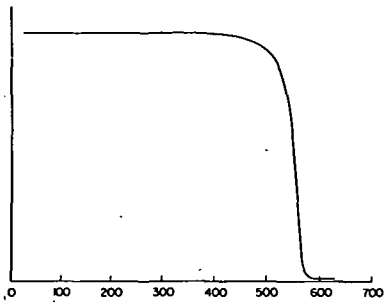
PERFLUOROALKYL POLYTRIAZINES CONTAINING PENDENT IODODIFLUOROMETHYL GROUPS Patent

Robert W. Rosser (PCR, Inc., Gainesville, Fla.) and Theodore Psarras, inventors (to NASA) (PCR, Inc., Gainesville, Fla.) Issued 18 Nov. 1980 5 p Filed 8 May 1979 Supersedes N79-24153 (17 - 15, p 1960) Sponsored by NASA

(NASA-Case-ARC-11241-1; US-Patent-4,234,715; US-Patent-Appl-SN-037066; US-Patent-Class-528-362; US-Patent-Class-260-33.8F; US-Patent-Class-528-401; US-Patent-Class-528-422) Avail: US Patent and Trademark Office CSCL 07D

New perfluoroalkyl polytriazines containing pendent iododifluoromethyl groups are prepared by the reaction of perfluoroalkyl dinitriles with ammonia to form poly(imidoylamidines), followed by the cyclization of the imidoylamidine groups with, e.g., various mixtures of a perfluoroacyl fluoride with an omega iodoperfluoroacyl fluoride. The polytriazines obtained can be cured by heat which causes crosslinking at the iododifluoromethyl groups by elimination of iodine and formation of carbon-to-carbon bonds.

Official Gazette of the U.S. Patent and Trademark Office



N81-16174*# National Aeronautics and Space Administration. *Pasadena Office, Calif.*

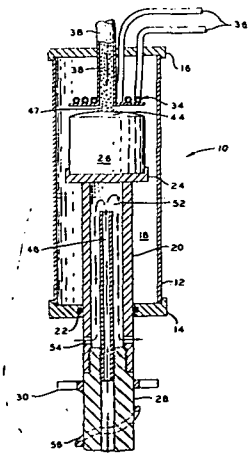
A METHOD FOR PRODUCING A SOLIDIFIED BODY OF SILICON Patent Application

Kazuo A. Yamakawa (JPL) and Ralph Lutwack, inventors (to NASA) (JPL) Filed 24 Dec. 1980 13 p

(Contract NAS7-100)

(NASA-Case-NPO-15250-1; US-Patent-Appl-SN-219639) Avail: NTIS HC A02/MF A01 CSCL 07D

A method is disclosed for producing solidified bodies from fluid material such as producing a polycrystalline body of silicon from submicron silicon powder, as well as various silicon compounds. A pedestal of a generally cylindrical configuration is supported for rotation beneath a heating unit for purposes of establishing a layer of molten material into which is deposited a stream of submicron silicon powder from a tube. The material of the layer is incrementally frozen as the pedestal is lowered. A more usable form of silicon is provided for use in the solar cell industry. NASA



N81-17187* National Aeronautics and Space Administration. Pasadena Office, Calif.

INSOLUBLE POLYELECTROLYTE AND ION-EXCHANGE HOLLOW FIBER IMPREGNATED THEREWITH Patent

Alan Rembaum, inventor (to NASA) (JPL) Issued 29 Mar. 1977 9 p Filed 4 Apr. 1974 Sponsored by NASA

(NASA-Case-NPO-13530-1; US-Patent-4,014,798; US-Patent-Class-210-500M; US-Patent-Class-260-2.1; US-Patent-Class-260-2.2R) Avail: US Patent and Trademark Office CSCL 07D

The number of quaternary sites and ion exchange capacity of a polyquaternary, cross linked, insoluble copolymer of a vinyl pyridine and a dihalo organic compound is increased by about 15-35% by reaction of the polymer with an amine followed by quaternization, if required. The polymer forms spontaneously in the presence of a substrate such as within the pores of a hollow fiber. The improved resin impregnated fiber may be utilized to remove ions from waste or process steams.

Official Gazette of the U.S. Patent and Trademark Office

N81-19242* National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.

PROCESS FOR PREPARATION OF LARGE-PARTICLE-SIZE MONODISPERSE LATEXES Patent

John W. Vanderhoff (Lehigh Univ.), Fortunato J. Micale (Lehigh Univ.), Mohamed S. El-Aasser (Lehigh Univ.), and Dale M. Kornfeld, inventors (to NASA) Issued 27 Jan. 1981 4 p Filed 29 Dec. 1978 Supersedes N79-14171 (17 - 05, p 0571)

(NASA-Case-MFS-26000-1; US-Patent-4,247,434; US-Patent-Appl-SN-974474; US-Patent-Class-260-29.6RB; US-Patent-Class-526-88; US-Patent-Class-526-201) Avail: US Patent and Trademark Office CSCL 07A

Monodisperse latexes having a particle size in the range of 2 to 40 microns are prepared by seeded emulsion polymerization in microgravity. A reaction mixture containing smaller monodisperse latex seed particles, predetermined amounts of monomer, emulsifier, initiator, inhibitor and water is placed in a microgravity environment, and polymerization is initiated by heating. The reaction is allowed to continue until the seed particles grow to a predetermined size, and the resulting enlarged particles are then recovered. A plurality of particle-growing steps can be used to reach larger sizes within the stated range, with enlarge particles from the previous steps being used as seed particles for the succeeding steps. Microgravity enables preparation of particles in the stated size range by avoiding gravity related problems of creaming and settling, and flocculation induced by mechanical shear that have precluded their preparation in a normal gravity environment.

Official Gazette of the U.S. Patent and Trademark Office

N81-19244* National Aeronautics and Space Administration. Pasadena Office, Calif.

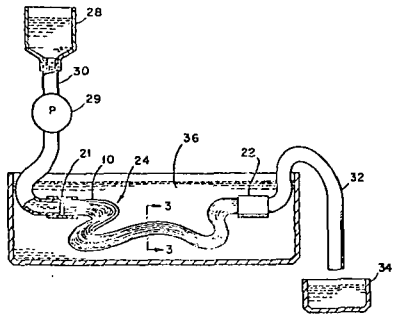
ION-EXCHANGE HOLLOW FIBERS

Alan Rembaum (JPL), Shiao-Ping S. Yen (JPL), and Elias Klein, inventors (to NASA) (JPL) 16 Mar. 1976 10 p Filed 23 May 1973

(NASA-Case-NPO-13309-1; US-Patent-3,944,485; US-Patent-Appl-SN-363130; US-Patent-Class-210-24; US-Patent-Class-260-2.1E; US-Patent-Class-260-2.2R; US-Patent-Class-264-41) Avail: US Patent and Trademark Office CSCL 07D

An ion-exchange hollow fiber is prepared by introducing into the wall of the fiber polymerizable liquid monomers, and polymerizing the monomers therein to form solid, insoluble, crosslinked, ion-exchange resin particles which embed in the wall of the fiber. Excess particles blocking the central passage or bore of the fiber are removed by forcing liquid through the fiber. The fibers have high ion-exchange capacity, a practical wall permeability and good mechanical strength even with very thin wall dimensions. Experimental investigation of bundles of ion-exchange hollow fibers attached to a header assembly have shown the fiber to be very efficient in removing counterions from solution.

Official Gazette of the U.S. Patent and Trademark Office



N81-19245*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

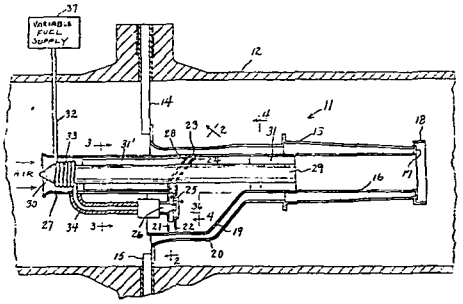
HEAT PIPES TO REDUCE ENGINE EXHAUST EMISSIONS Patent Application

Donald F. Schultz, inventor (to NASA) Filed 30 Jan. 1980 17 p

(NASA-Case-LEW-12590-1; US-Patent-Appl-SN-229693) Avail: NTIS HC A02/MF A01 CSCL 21B

A fuel combustor employing heat transfer devices for improving combustion efficiency and reducing engine exhaust emissions is described. The fuel combustor consists of an elongated casing with an air inlet conduit portion at one end. An elongated heat pipe is mounted longitudinally in the casing and is offset from and extends alongside an intermediate combustion space. The heat pipe is in heating transmitting relationship with the air intake conduit for heating incoming air. A fuel conduit has a portion engaged in heat transfer relationship of the heat pipe for preheating the fuel. The offset position of the heat pipe relative to the combustion space minimizes the quenching effect of the heat pipe on the gaseous products of combustion, as well as reducing coking of the fuel on the heat pipe, thereby improving the efficiency of the combustor.

NASA



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26 METALLIC MATERIALS

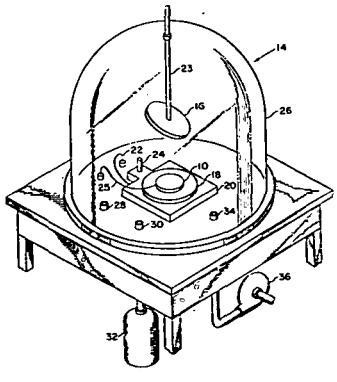
Includes physical, chemical, and mechanical properties of metals, e.g., corrosion; and metallurgy.

N81-12211*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
NiCrAl TERNARY ALLOY HAVING IMPROVED CYCLIC OXIDATION RESISTANCE Patent Application
C. A. Barrett, inventor (to NASA) Filed 23 Oct. 1980 6 p
(NASA-Case-LEW-13339-1; US-Patent-Appl-SN-199769) Avail: NTIS HC A02/MF A01 CSCL 11F

NiCrAl alloys were improved by the addition of zirconium. These alloys are in the beta or gamma/gamma prime + beta region of the ternary system. Zirconium was added in a very low amount between 0.06 and 0.20 weight percent. There was a narrow optimum zirconium level at the low value of 0.13 weight percent. Maximum resistance to cyclic oxidation was achieved when the zirconium addition was at the optimum value. NASA

N81-16209*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
IMPROVED REFRACTORY COATINGS Patent Application
William A. Brainard, inventor (to NASA) Filed 29 Sep. 1980 8 p
(NASA-Case-LEW-23169-2; US-Patent-Appl-SN-191746) Avail: NTIS HC A02/MF A01 CSCL 11F

The adhesion, friction and wear properties of sputtered refractory coatings on substrates of materials that form stable nitrides are enhanced by placing each substrate directly below a titanium carbide target of a commercial radiofrequency diode apparatus in a vacuum chamber. Nitrogen is bled into the system through a nozzle resulting in a small partial pressure of about 0.5% to 2.5% during the first two minutes of deposition. The flow of nitrogen is then stopped, and the sputtering ambient is reduced to pure argon through a nozzle without interrupting the sputtering process. When nitrogen is deliberately introduced during the crucial interface formation, some of the titanium at the interface reacts to form titanium nitride while the metal of the substrate also forms the nitride. These two nitrides atomically mixed together in the interfacial region act to more strongly bond the growing titanium carbide coating as it forms on the substrate. NASA



27 NONMETALLIC MATERIALS

Includes physical, chemical, and mechanical properties of plastics, elastomers, lubricants, polymers, textiles, adhesives, and ceramic materials.

N81-14076* National Aeronautics and Space Administration. Pasadena Office, Calif.
MEMBRANE CONSISTING OF POLYQUATERNARY AMINE ION EXCHANGE POLYMER NETWORK INTERPENETRATING THE CHAINS OF THERMOPLASTIC MATRIX POLYMER Patent
Alan Rembaum (JPL, California Inst. of Tech., Pasadena) and Carl J. Wallace, inventors (to NASA) (JPL, California Inst. of Tech., Pasadena) Issued 10 Oct. 1978 11 p Filed 23 Feb. 1977 Sponsored by NASA
(NASA-Case-NPO-14001-1; US-Patent-4,119,581; US-Patent-Appl-SN-771245; US-Patent-Class-521-27; US-Patent-Class-210-24R; US-Patent-Class-260-2.1E; US-Patent-Class-260-17A; US-patent-Class-260-858; US-Patent-Class-260-886; US-Patent-Class-260-895; US-Patent-Class-260-898; US-Patent-Class-260-8900 US-Patent-Class-260-901; US-Patent-Class-521-62; US-Patent-Class-521-32) Avail: US Patent and Trademark Office CSCL 07D

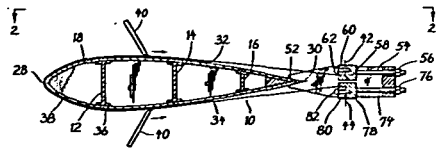
An ion exchange membrane was formed from a solution containing dissolved matrix polymer and a set of monomers which are capable of reacting to form a polyquaternary ion exchange material; for example vinyl pyride and a dihalo hydrocarbon. After casting solution and evaporation of the volatile component's, a relatively strong ion exchange membrane was obtained which is capable of removing anions, such as nitrate or chromate from water. The ion exchange polymer forms an interpenetrating network with the chains of the matrix polymer.

Official Gazette of the U.S. Patent and Trademark Office

N81-14077* National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.
SURFACE FINISHING Patent
Jack A. Kinzler, James T. Hefferman, Leroy G. Fehrenkamp, and William S. Lee, inventors (to NASA) Issued 30 Sep. 1980 8 p Filed 25 Jan. 1979 Supersedes N79-21183 (17-12, p 1540) Continuation of abandoned US Patent Appl. SN-785279, filed 6 Apr. 1977 which is a division of US Patent Appl. SN-568541, US Patent-4,032,089, filed 16 Apr. 1975
(NASA-Case-MSC-12631-3; US-Patent-4,225,372; US-Patent-Appl-SN-006952; US-Patent-Class-156-154; US-Patent-Class-156-160; US-Patent-Class-156-163; US-Patent-Class-156-212; US-Patent-Class-156-267; US-Patent-Class-156-295; US-Patent-Class-156-323; US-Patent-Class-156-331; US-Patent-Appl-SN-785279; US-Patent-Appl-SN-568541; US-Patent-4,032,089) Avail: US Patent and Trademark Office CSCL 11A

A surface of an article adapted for relative motion with a fluid environment is finished by coating the surface with a fluid adhesive, covering the adhesive with a sheet of flexible film material under tension on the film material whereby the tensioned film material is bonded to the surface by the adhesive.

Official Gazette of the U.S. Patent and Trademark Office



N81-14078* National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
METHOD FOR PREPARING ADDITION TYPE POLYIMIDE PREPREGS Patent
Terry L. St.Clair, inventor (to NASA) Issued 11 Nov. 1980 5 p Filed 13 Feb. 1979 Supersedes N79-19160 (17-10, p 1257) Division of US Patent Appl. SN-839963, filed 6 Oct. 1977, US Patent-4, 166, 170
(NASA-Case-LAR-12054-2; US-Patent-4,233,258; US-Patent-Appl-SN-011737; US-Patent-Class-264-137; US-Patent-Class-427-429; US-Patent-Class-427-385.5; US-Patent-Class-428-473.5; US-Patent-4,166,170; US-Patent-Appl-SN-839963) Avail: US Patent and Trademark Office CSCL 07C

A novel addition polyimide based on the use of liquid monomers wherein the essentially solventless prepreg produced therefrom retains good drape, tack and other mechanical properties.

Official Gazette of the U.S. Patent and Trademark Office

N81-15104* National Aeronautics and Space Administration. Pasadena Office, Calif.
VISCOELASTIC CATIONIC POLYMERS CONTAINING THE URETHANE LINKAGE Patent
Alan Rembaum, inventor (to NASA) (JPL, California Inst. of Technology, Pasadena) Issued 11 Apr. 1972 9 p Filed 19 May 1969
(NASA-Case-NPO-10830-1; US-Patent-3,655,814; US-Patent-Appl-SN-825489; US-Patent-Class-117-6; US-Patent-Class-138.8R; US-Patent-Class-260-33.6UB; US-Patent-Class-33.8UB; US-Patent-Class-37N; US-Patent-Class-41R; US-Patent-Class-77.5AQ; US-Patent-Class-77.5CH; US-Patent-Class-94.9N; US-Patent-Class-859R) Avail: US Patent and Trademark Office CSCL 07D

A method for the synthesis and manufacturing of elastomeric compositions and articles containing quaternary nitrogen centers and condensation residues along the polymeric backbone of the centers is presented. Linear and cross-linked straight chain and block polymers having a wide damping temperature range were synthesized. Formulae for the viscoelastic cationic polymers are presented. T.M.

N81-15107*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
THERMOSET-THERMOPLASTIC AROMATIC POLYAMIDES Patent Application
Terry L. St.Clair, James F. Wolfe (Virginia Polytechnic Inst. and State Univ.), and Thomas D. Greenwood, inventors (to NASA) (King Coll.) Filed 23 Oct. 1980 11 p
(NASA-Case-LAR-12723-1; US-Patent-Appl-SN-199768) Avail: NTIS HC A02/MF A01 CSCL 07C

A composition and method for increasing the use temperature of polyamides based on the incorporation of a latent crosslinking agent into the polymer backbone, wherein high temperature performance is achieved without sacrificing solubility or processability are described. NASA

N81-16238*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
METHOD OF BONDING PLASTICIZED ELASTOMER TO METAL AND ARTICLE PRODUCED THEREBY Patent Application
William T. White, Johnny M. Clemons, and Frank E. Ledbetter, inventors (to NASA) Filed 19 Dec. 1980 9 p
(NASA-Case-MFS-25181-1; US-Patent-Appl-SN-218585) Avail: NTIS HC A02/MF A01 CSCL 11A

A plasticized elastomer is securely bonded to a metal surface by interposing between the adhesive coated metal surface and the elastomer a sheet of material obtained by combining adhesive with a portion of the elastomer that has been treated to remove plasticizers. The assembly is then heated in a mold under pressure. The sheet material is made up by dissolving a portion of the plasticized elastomer in an organic solvent, casting the solution, exposing it to a vacuum to remove the solvent and plasticizers, dissolving the deplasticized material in liquid adhesive and casting and drying the resulting liquid. NASA

N81-17259* National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
PROCESS FOR THE PREPARATION OF FLUORINE CONTAINING CROSSLINKED ELASTOMERIC POLYTRIAZINE AND PRODUCT SO PRODUCED Patent
Robert W. Rosser and Roger A. Korus, inventors (to NASA) (San Jose State Univ.) Issued 30 Dec. 1980 5 p Filed 9 Apr. 1979 Supersedes N79-22301 (17 - 13, p 1696)
(NASA-Case-ARC-11248-1; US-Patent-4,242,498; US-Patent-Appl-SN-028300; US-Patent-Class-528-362; US-Patent-Class-528-401; US-Patent-Class-528-422; US-Patent-Class-528-423) Avail: US Patent and Trademark Office CSCL 07D

Crosslinking elastomeric polytriazines are prepared by a 4 step procedure which consists of (1) forming a poly (imidoylamidine) by the reaction, under reflux conditions, of anhydrous ammonia with certain perfluorinated alkyl or alkylether dinitriles; (2) forming a linear polytriazine by cyclizing the imidoylamidine linkages by reaction with certain perfluorinated alkyl or alkylether acid anhydrides or halides; (3) extending the linear polytriazine chain by further refluxing in anhydrous ammonia; and (4) heating to cyclize the new imidoylamidine and thereby crosslink the polymer.

Official Gazette of the U.S. Patent and Trademark Office

N81-17260* National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
CURING AGENT FOR POLYEPOXIDES AND EPOXY RESINS AND COMPOSITES CURED THEREWITH Patent
Tito T. Serafini, Peter Delvigs, and Raymond D. Vannucci, inventors (to NASA) Issued 13 Jan. 1981 5 p Filed 30 Aug. 1979 Supersedes N79-31345 (17 - 22, p2925)
(NASA-Case-LEW-13226-1; US-Patent-4,244,857; US-Patent-Appl-SN-070771; US-Patent-Class-260-37EP; US-Patent-Class-260-326S; US-Patent-Class-260-326N; US-Patent-Class-538-117; US-Patent-Class-528-118; US-Patent-Class-528-322) Avail: US Patent and Trademark Office CSCL 07C

A curing for a polyepoxide is described which contains a divalent aryl radical such as phenylene a tetravalent aryl radical such as a tetravalent benzene radical. An epoxide is cured by admixture with the curing agent. The cured epoxy product retains the usual properties of cured epoxides and, in addition, has a higher char residue after burning, on the order of 45% by weight. The higher char residue is of value in preventing release to the atmosphere of carbon fibers from carbon fiber-epoxy resin composites in the event of burning of the composite.

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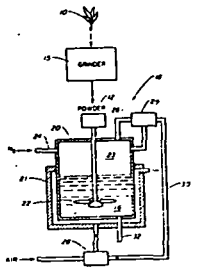
N81-17261* National Aeronautics and Space Administration. Pasadena Office, Calif.
MOLTEN SALT PYROLYSIS OF LATEX Patent
Albert J. Bauman, inventor (to NASA) (JPL) Issued 20 Jan. 1981 5 p Filed 27 Apr. 1978 Supersedes N80-10361 (18 - 01, p0050) Sponsored by NASA
(NASA-Case-NPO-14315-1; US-Patent-4,246,001; US-Patent-Appl-SN-900659; US-Patent-Class-44-62; US-Patent-Class-44-50; US-Patent-Class-201-8; US-Patent-Class-201-10; US-Patent-Class-201-25) Avail: US Patent and Trademark Office CSCL 07C

Latex-rich plants such as Guayule or extracts thereof are pyrolyzed in an inert nitrogen atmosphere inorganic salt melts such as a LiCl/KCl eutectic at a temperature of about 500 C. The yield is over 60% of a highly aromatic, combustible

hydrocarbon oil suitable for use as a synthetic liquid fuel.
Official Gazette of the U.S. Patent and Trademark Office



N81-17262* National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
THE 1,2,4-OXADIAZOLE ELASTOMERS Patent
Robert W. Rosser, Ibrahim M. Shalhoub (San Jose State Univ.), and Hanoi Kwong, inventors (to NASA) (San Jose State Univ.) Issued 13 Jan. 1981 5 p Filed 9 Apr. 1979 Supersedes N79-22302 (17 - 13, p 1696)
(NASA-Case-ARC-11253-1; US-Patent-4,245,085;
US-Patent-Appl-SN-028301; US-Patent-Class-528-310;
US-Patent-Class-528-362; US-Patent-Class-528-401;
US-Patent-Class-528-422) Avail: US Patent and Trademark Office CSCL 07D

Crosslinked 1,2,4-oxadiazole elastomers were prepared either by thermally condensing a monomer having the formula HwN(HON)C-R-Q, wherein Q is a triazine ring forming group such as nitrile or amidine, or by a mixture of said monomer with RC(NOH)NH22, with R in these formulas standing for a bivalent organic radical containing fluorine, hydrogen, or trifluoromethyl. In the monomer charge, the overall proportions of amidoxime groups to triazine ring forming groups varies depending on the extent of crosslinking desired in the final polymer. The heat and chemical resistant elastomers disclosed can serve, for instance, as adhesives, caulking compounds, channel sealants, fuel tank liners. Official Gazette of the U.S. Patent and Trademark Office

N81-19296* National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
COMPOSITION AND METHOD FOR MAKING POLYIMIDE RESIN-REINFORCED FABRIC Patent
Tito T. Serafini and Peter Delvigs, inventors (to NASA) Issued 13 Jan. 1981 4 p Filed 6 Apr. 1979 Supersedes N79-24061 (17 - 15, p 1947)
(NASA-Case-LEW-12933-1; US-Patent-4,244,853;
US-Patent-Appl-SN-027557; US-Patent-Class-260-33.4R;
US-Patent-Class-427-221; US-Patent-Class-427-379;
US-Patent-Class-528-353) Avail: US Patent and Trademark Office CSCL 11E

A composition for making polyimide resin reinforced fibers or fabric is discussed. The composition includes a polyfunctional ester, a polyfunctional amine, and an end capping agent. The composition is impregnated into fibers or fabric and heated to form prepreg material. The tack retention characteristics of this prepreg material are improved by incorporating into the composition a liquid olefinic material compatible with the other ingredients of the composition. The prepreg material is heated at a higher temperature to effect formation of the polyimide resin and the monomeric additive is incorporated in the polyimide polymer structure.

Official Gazette of the U.S. Patent and Trademark Office

28 PROPELLANTS AND FUELS

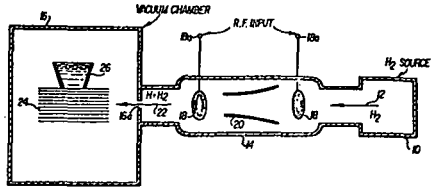
Includes rocket propellants, igniters, and oxidizers, storage and handling; and aircraft fuels.

For related information see also *07 Aircraft Propulsion and Power, 20 Spacecraft Propulsion and Power,* and *44 Energy Production and Conversion.*

N81-14103* National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
ATOMIC HYDROGEN STORAGE METHOD AND APPARATUS Patent
John A. Woollam, inventor (to NASA) Issued 21 Oct. 1980 4 p Filed 6 Feb. 1979 Supersedes N79-18455 (17-09, p 1157) Division of US Patent Appl. SN-837794, filed 29 Sep. 1977, US Patent-4,193, 827, which is a division of US Patent Appl. SN-676432, filed 13 Apr. 1976, US Patent-4, 077, 788
(NASA-Case-LEW-12081-3; US-Patent-4,229,196;
US-Patent-4,193,827; US-Patent-4,077,788;
US-Patent-Appl-SN-009887; US-Patent-Appl-SN-837794;
US-Patent-Appl-SN-676432; US-Patent-Class-62-40;
US-Patent-Class-62-47; US-Patent-Class-62-18;
US-Patent-Class-62-12; US-Patent-Class-55-2;
US-Patent-Class-423-648R; US-Patent-Class-156-344;
US-Patent-Class-149-1; US-Patent-Class-44-7R) Avail: US Patent and Trademark Office CSCL 21D

Atomic hydrogen, for use as a fuel or as an explosive, is stored in the presence of a strong magnetic field in exfoliated layered compounds such as molybdenum disulfide or an elemental layer material such as graphite. The compounds maintained at liquid helium temperatures and the atomic hydrogen is collected on the surfaces of the layered compound which are exposed during delamination (exfoliation). The strong magnetic field and the low temperature combine to prevent the atoms of hydrogen from recombining to form molecules.

Official Gazette of the U.S. Patent and Trademark Office



N81-15119* National Aeronautics and Space Administration. Pasadena Office, Calif.
RECOVERY OF ALUMINUM FROM COMPOSITE PROPELLANTS Patent
Graham C. Shaw, inventor (to NASA) (Thiokol Corp., Brigham City, Utah) Issued 21 Oct. 1980 5 p Filed 29 Sep. 1978 Supersedes N79-10225 (17 - 01, p 0031) Sponsored by NASA
(NASA-Case-NPO-14110-1; US-Patent-4,229,182;
US-Patent-Appl-SN-947000; US-Patent-Class-23-293R;
US-Patent-Class-75-25; US-Patent-Class-149-108.4;
US-Patent-Class-260-96D; US-Patent-Class-252-364;
US-Patent-Class-423-1; US-Patent-Class-423-131;
US-Patent-Class-423-658.5; US-Patent-Class-525-384;
US-Patent-Class-526-914) Avail: US Patent and Trademark Office CSCL 21I

Aluminum was recovered from solid rocket propellant containing a small amount of oxidizer by depolymerizing and dissolving propellant binders (containing functional or hydrolyzable groups in a solution of sodium methoxide) in an alcohol solvent optionally containing an aliphatic or aromatic hydrocarbon co-solvent. The solution was filtered to recover substantially all the aluminum in active form.

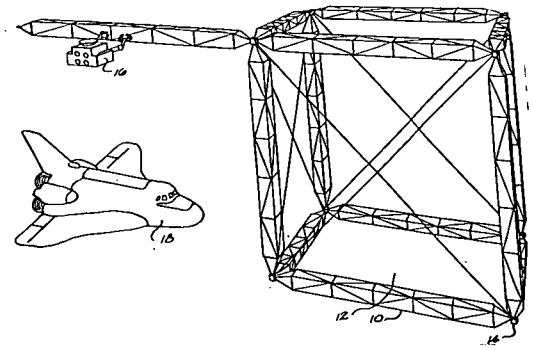
Official Gazette of the U.S. Patent and Trademark Office

31 ENGINEERING (GENERAL)

Includes vacuum technology; control engineering; display engineering; and cryogenics.

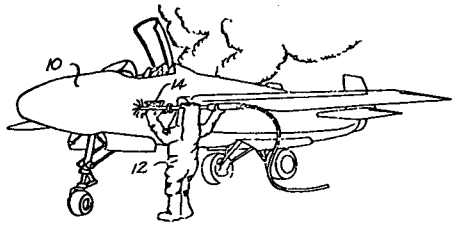
N81-12283*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
BEAM CONNECTOR APPARATUS AND ASSEMBLY Patent Application
Georg vonTiesenhausen, inventor (to NASA) Filed 8 Oct. 1980 13 p
(NASA-Case-MFS-25134-1; US-Patent-Appl-SN-195226) Avail: NTIS HC A02/MF A01 CSCL 13B

A connector apparatus and assembly is described for connecting beams and the like structural members which is particularly advantageous for connecting two members together when moved laterally into place. The connector apparatus requires no relative longitudinal movement between the ends of the beams or members being connected to make a connection joint. The connector apparatus includes a receptacle member and a connector housing carried by opposed ends of the structural member being connected wherein a spring-loaded connector member is carried by the connector housing which may be released for extension and engagement into the receptacle member. NASA



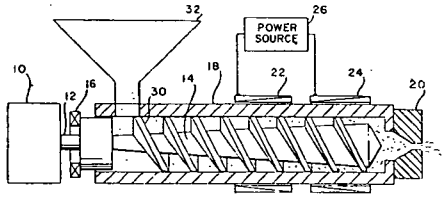
N81-14137* National Aeronautics and Space Administration. John F. Kennedy Space Center, Cocoa Beach, Fla.
FIRE EXTINGUISHING APPARATUS HAVING A SLIDABLE MASS FOR A PENETRATOR NOZZLE Patent
Norris C. Gray, Robert M. Senseny (Boeing Aerospace Co., Seattle, Wash.), and Philip N. Bolton (Boeing Aerospace Co., Seattle, Wash.) Issued 26 Aug. 1980 4 p Filed 19 Apr. 1978 Supersedes N78-22328 (16-13, p 1698)
(NASA-Case-KSC-11064-1; US-Patent-4,219,084; US-Patent-Appl-SN-897840; US-Patent-Class-169-70; US-Patent-Class-169-62) Avail: US Patent and Trademark Office CSCL 13L

A fire extinguishing apparatus for delivering an extinguishing agent through a tarrier surrounding a structure into its interior includes an elongated tubular nozzle body which has a pointed penetrating head carried on one end of the tubular body. A source of extinguishing agent coupled to the opposite end of the tubular body is fed through and passes through passages adjacent the head for delivering the extinguishing agent to the interior of the structure. A slidable mass is carried on the tubular body on a remote end of the tubular body from the penetrating head. By manipulating the slidable mass and bringing such in contact with an abutment the force imparted to the tubular body causes the head to penetrate the structure.
Official Gazette of the U.S. Patent and Trademark Office



N81-15154* National Aeronautics and Space Administration. Pasadena Office, Calif.
CONTINUOUS COAL PROCESSING METHOD Patent
Porter R. Ryason, inventor (to NASA) (JPL, California Inst. of Tech., Pasadena) Issued 10 Jun. 1980 11 p Filed 28 Sep. 1976 Supersedes N80-10377 (18 - 01, p 0052) Continuation-in-part of abandoned US Patent Appl. SN-623389, filed 17 Oct. 1975 Sponsored by NASA
(NASA-Case-NPO-13758-2; US-Patent-4,206,713; US-Patent-Appl-SN-727444; US-Patent-Class-110-347; US-Patent-Class-110-218; US-Patent-Class-110-229; US-Patent-Class-110-232; US-Patent-Class-110-343; US-Patent-Class-202-118; US-Patent-Class-264-23; US-Patent-Class-425-378R; US-Patent-Appl-SN-623389) Avail: US Patent and Trademark Office CSCL 13H

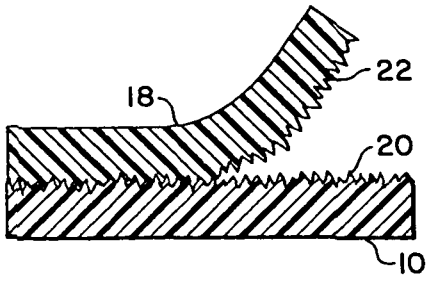
A coal pump is provided in which solid coal is heated in the barrel of an extruder under pressure to a temperature at which the coal assumes plastic properties. The coal is continuously extruded, without static zones, using, for example, screw extrusion preferably without venting through a reduced diameter die to form a dispersed spray. As a result, the dispersed coal may be continuously injected into vessels or combustors at any pressure up to the maximum pressure developed in the extrusion device. The coal may be premixed with other materials such as desulfurization aids or reducible metal ores so that reactions occur, during or after conversion to its plastic state. Alternatively, the coal may be processed and caused to react after extrusion, through the die, with, for example, liquid oxidizers, whereby a coal reactor is provided.
Official Gazette of the U.S. Patent and Trademark Office



N81-16327*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
TEXTURING POLYMER SURFACES BY TRANSFER CASTING Patent Application
Bruce A. Banks, Albert J. Weigand, and James S. Sovey, inventors (to NASA) Filed 19 Dec. 1980 7 p
(NASA-Case-LEW-13120-1; US-Patent-Appl-SN-218587) Avail: NTIS HC A02/MF A01 CSCL 13H

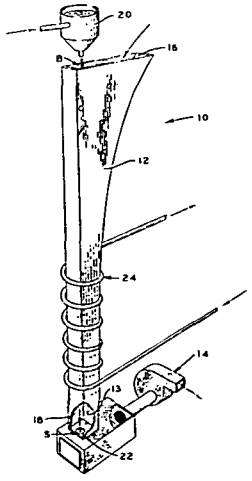
A surface of a fluorocarbon polymer is exposed to a beam of ions from a source to texture it. The polymer which is to be surface roughened is then cast over the textured surface of the fluorocarbon polymer. After curing, the cast polymer is peeled off the textured fluorocarbon polymer and the peeled off surface

has a negative replica of the textured surface. The microscopic surface texture provides large surface areas for adhesive bonding. In cardiovascular prosthesis applications the surfaces are relied on for the development of a thin adherent well nourished thrombus. NASA



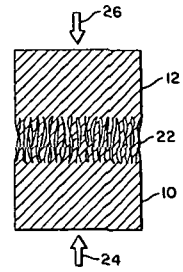
N81-16328*# National Aeronautics and Space Administration. Pasadena Office, Calif.
METHOD OF FORMING FROZEN SPHERES IN A FORCE-FREE DROP TOWER Patent Application
James M. Kendall, Jr., inventor (to NASA) (JPL) Filed 24 Dec. 1980 11 p
(Contract NAS7-100)
(NASA-Case-NPO-14845-1; US-Patent-Appl-SN-219680) Avail: NTIS HC A02/MF A01 CSCL 13H

A technique is disclosed for uniformly shaping hollow glass spheres by the effects of surface tension acting on bubbles of glass in its molten state. The method is characterized by the steps of establishing a downwardly flowing stream of air accelerated at a one-G rate of acceleration through a drop tower, introducing into the stream of air free-falling bubbles of molten glass, and freezing the bubbles in the stream as they are accelerated at a one-G rate of acceleration. NASA



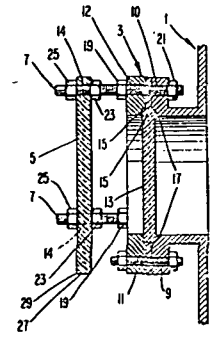
N81-16329*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
MECHANICAL BONDING OF METAL Patent Application
Bruce A. Banks, inventor (to NASA) Filed 26 Nov. 1980 8 p
(NASA-Case-LEW-12941-1; US-Patent-Appl-SN-210632) Avail: NTIS HC A02/MF A01 CSCL 13H

The metal surfaces of the structures that are to be bonded are exposed to an ion beam together with a target of low sputtering yield material. This material deposits on the surfaces and creates sites of sputter resistance which evolve into peaks of a conelike surface microstructure. The textured metal surfaces are arranged in face-to-face relationship and compressed together with plastic deformation which mechanically interlocks the cone. A large interface area is produced which minimizes thermal and electrical losses. Also, no electrical power or heat is required during metal joining. The process can be performed in either air or vacuum. NASA



N81-19343* National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
SAFETY SHIELD FOR VACUUM/PRESSURE CHAMBER VIEWING PORT Patent
Richard A. Shimansky and Rodney S. Spencer, inventors (to NASA) Issued 20 Jan. 1981 4 p Filed 29 Jun. 1979 Supersedes N79-32207 (17 - 23, p 3045)
(NASA-Case-GSC-12513-1; US-Patent-4,254,566; US-Patent-Appl-SN-053571; US-Patent-Class-109-49.5; US-Patent-Class-49-171; US-Patent-Class-109-58.5; US-Patent-Class-220-82R; US-Patent-Class-220-89A) Avail: US Patent and Trademark Office CSCL 13L

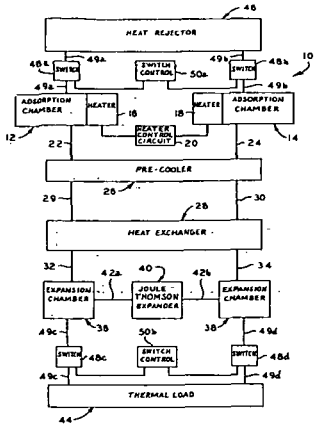
Observers are protected from flying debris resulting from a failure of a vacuum or pressure chamber viewing port following an implosion or explosion by an optically clear shatter resistant safety shield which spaced apart from the viewing port on the outer surface of the chamber.
Official Gazette of the U.S. Patent and Trademark Office



N81-19344*# National Aeronautics and Space Administration. Pasadena Office, Calif.
A CYCLING JOULE THOMSON REFRIGERATOR Patent Application
Emanuel Tward, inventor (to NASA) (JPL) Filed 28 Jan. 1981 18 p
(Contract NAS7-100)

(NASA-Case-NPO-15251-1; NASA-Case-NPO-15254-1; US-Patent-Appl-SN-229239) Avail: NTIS HC A02/MF A01 CSCL 13A

A symmetrical adsorption pump/compressor system having a pair of mirror image legs and a Joule-Thomson expander, or valve, interposed between the legs thereof for providing a new, efficient refrigeration cycle is described. The system further includes a plurality of gas operational heat switches adapted selectively to transfer thereto heat from a thermal load and to transfer or discharge heat therefrom through a heat projector, such as a radiator or the like. The heat switches comprise gas pressurizable chambers adapted for alternate pressurization in response to adsorption and desorption of a pressurizing gas confined therein. Author



32 COMMUNICATIONS

Includes land and global communications; communications theory; and optical communications.

For related information see also *04 Aircraft Communications and Navigation* and *17 Spacecraft Communications, Command and Tracking.*

N81-14185* National Aeronautics and Space Administration. Pasadena Office, Calif.

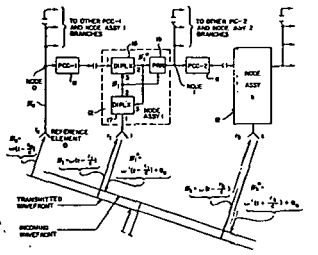
FREQUENCY TRANSLATING PHASE CONJUGATION CIRCUIT FOR ACTIVE RETRODIRECTIVE ANTENNA ARRAY Patent

Ralph C. Chernoff, inventor (to NASA) (JPL, California Inst. of Tech., Pasadena) Issued 11 Nov. 1980 10 p Filed 29 Dec. 1978 Supersedes N79-14277 (17-05, p 0585) Sponsored by NASA

(NASA-Case-NPO-14536-1; US-Patent-4,233,606; US-Patent-Appl-SN-974471; US-Patent-Class-343-100TD) Avail: US Patent and Trademark Office CSCL 09C

An active retrodirective antenna array which has central phasing from a reference antenna element through a 'tree' structured network of transmission lines utilizes a number of phase conjugate circuits (PCCs) at each node and a phase reference regeneration circuit (PRR) at each node except the initial node. Each node virtually coincides with an element of the array. A PCC generates the exact conjugate phase of an incident signal using a phase locked loop which combines the phases in an up converter, divides the sum by 2 and mixes the result with the phase in a down converter for phase detection. The PRR extracts the phase from the conjugate phase. Both the PCC and the PRR are not only exact but also free from mixer degeneracy.

Official Gazette of the U.S. Patent and Trademark Office



N81-14186* National Aeronautics and Space Administration. Pasadena Office, Calif.

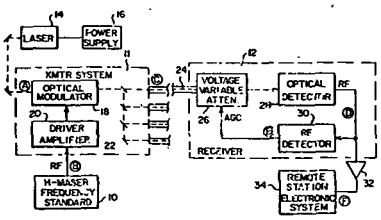
PRECISE RF TIMING SIGNAL DISTRIBUTION TO REMOTE STATIONS Patent

Georg F. Lutes, Jr., inventor (to NASA) (JPL, California Inst. of Tech., Pasadena) Issued 18 Nov. 1980 4 p Filed 24 Sep. 1979 Supersedes N79-34013 (17-24, p 3284) Sponsored by NASA

(NASA-Case-NPO-14749-1; US-Patent-4,234,971; US-Patent-Appl-SN-078521; US-Patent-Class-455-619; US-Patent-Class-375-107; US-Patent-Class-455-51; US-Patent-Class-455-71) Avail: US Patent and Trademark Office CSCL 20N

A method and apparatus are disclosed for distributing a stable reference frequency from a hydrogen maser frequency standard, or similar RF source, to remote stations over great distances with very good phase stability, and with constant amplitude, at each distribution point using a light beam carrier. A technique for providing automatic gain control at an optical receiver with phase stability in the RF reference is provided.

Official Gazette of the U.S. Patent and Trademark Office



N81-14187* National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.

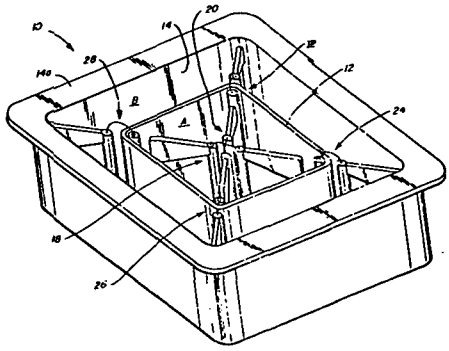
COAXIAL PHASED ARRAY ANTENNA Patent

Haynes Ellis, Jr., inventor (to NASA) (Rockwell International Corp., Downey, Calif.) Issued 19 Aug. 1980 12 p Filed 17 Oct. 1978 Supersedes N79-19194 (17 - 10, p 1262) Sponsored by NASA

(NASA-Case-MSC-16800-1; US-Patent-4,218,685; US-Patent-Appl-SN-953313; US-Patent-Class-343-727; US-Patent-Class-343-797; US-Patent-Class-343-789) Avail: US Patent and Trademark Office CSCL 09C

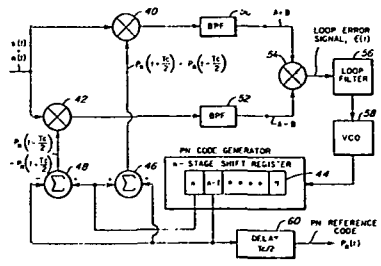
A coaxial antenna array for communicating circularly polarized electromagnetic radiation is disclosed. A pair of open ended antenna cavities is coaxially constructed and operates by excitation of linear radiation elements arranged within each of the cavities. A pair of crossed dipole radiation devices is centered within the inner cavity and operated by means of a phase shifting network circuit to transmit as well as receive circularly polarized radiation. Four monopole radiation devices are symmetrically arranged to operate in the outer cavity in phase quadrature by means of the phase shifting network circuit to both transmit and receive

circularly polarized electromagnetic radiation. Combined operation of the two antenna cavities with a 180 deg phase differential between the fields related to the two antenna cavities provides a broad beam, relatively wide frequency bandwidth communication capability. Particular embodiments disclosed feature a generally square cavity array as well as a circular cavity array.
Official Gazette of the U.S. Patent and Trademark Office



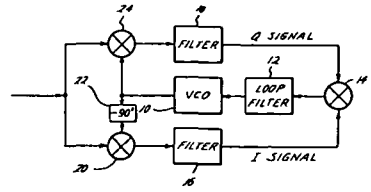
N81-15179* National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.
***PSEUDONOISE CODE TRACKING LOOP* Patent**
David T. LaFlame, inventor (to NASA) (Hughes Aircraft Co., Los Angeles) Issued 2 Sep. 1980 5 p Filed 21 May 1979 Supersedes N79-23347 (17 - 14, p 1844) Sponsored by NASA
(NASA-Case-MSC-18035-1; US-Patent-4,221,005; US-Patent-Appl-SN-041142; US-Patent-Class-375-1; US-Patent-Class-375-115; US-Patent-Class-375-58) Avail: US Patent and Trademark Office CSCL 17B

A delay-locked loop is presented for tracking a pseudonoise (PN) reference code in an incoming communication signal. The loop is less sensitive to gain imbalances, which can otherwise introduce timing errors in the PN reference code formed by the loop. Official Gazette of the U.S. Patent and Trademark Office



N81-16338*# National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.
RECEIVING AND TRACKING PHASE MODULATED SIGNALS Patent Application
Salvador Villarreal, Stuart Donald Lenett, and Herbert S. Kobayashi, inventors (to NASA) Filed 7 May 1980 14 p
(NASA-Case-MSC-16170-2; US-Patent-Appl-SN-147695) Avail: NTIS HC A02/MF A01 CSCL 17B

An apparatus and technique are described for receiving and tracking analog or digital phase modulated signals from 0 deg to 360 deg phase shift. In order to track a signal with many phases, a detector discerns the phase modulation of the incoming signal and a phase shifter generates a negative phase shift opposite in angle to the detected phase angle. This produces a converted series sideband component barrier signal. The residual carrier signal and the converted series sideband component carrier are added together to produce a tracking carrier signal. The tracking carrier signal is multiplied with the output from a voltage controlled oscillator in the tracking loop to obtain an error signal which drives the voltage controlled oscillator and tracks the incoming signal frequency. The technique is less susceptible to carrier interference which may degrade tracking and tracking may be performed at lower signal-to-noise ratios and for lower input signal power levels. NASA



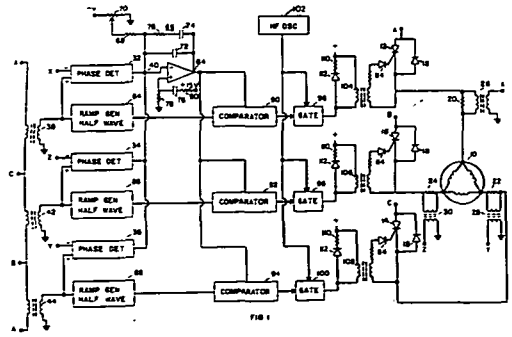
33 ELECTRONICS AND ELECTRICAL ENGINEERING

Includes test equipment and maintainability; components, e.g., tunnel diodes and transistors; microminiaturization; and integrated circuitry.

For related information see also *60 Computer Operations and Hardware* and *76 Solid-State Physics.*

N81-12330*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
THREE PHASE POWER FACTOR CONTROLLER Patent Application
Frank J. Nola, inventor (to NASA) Filed 23 Oct. 1980 17 p
(NASA-Case-MFS-25535-1; US-Patent-Appl-SN-199765) Avail: NTIS HC A02/MF A01 CSCL 09C

A power control circuit for a three phase induction motor is described. The power factors for the three phases are summed to provide a control signal. This control signal is particularly filtered and then employed to control the duty cycle of each phase of input power to the motor. NASA



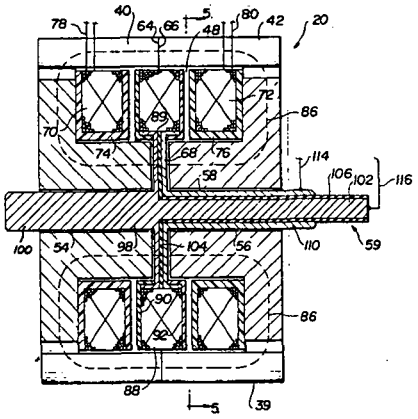
N81-12331*# National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.

NON-CONTACTING POWER TRANSFER DEVICE Patent Application

John Paulkovich and Philip A. Studer, inventors (to NASA) Filed 13 Nov. 1980 14 p

(NASA-CASE-GSC-12595-1; US-Patent-Appl-SN-206506) Avail: NTIS HC A02/MF A01 CSCL 09C

A transformer for coupling AC electrical energy from a stationary element to a rotating element without the use of sliding contacts is described. The transformer is of the rotary type and includes a ferrite core and two primary windings which are stationary with respect to a secondary winding which rotates within an annular cavity adjacent to an axial bore in the core. The core is comprised of two cup type core halves. Electrical connection to the secondary winding is made through a split bobbin assembly which couples to a coaxial shaft assembly located in the axial bore. The electrical coupling to the coaxial shaft assembly is made through a continuous transverse channel connecting the axial bore with the annular cavity. NASA



N81-14220* National Aeronautics and Space Administration. Pasadena Office, Calif.

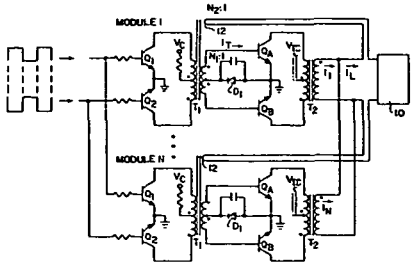
BASE DRIVE FOR PARALLELED INVERTER SYSTEMS Patent

Satoshi Nagano, inventor (to NASA) (JPL, California Inst. of Tech., Pasadena) Issued 9 Sep. 1980 5 p Filed 16 Feb. 1978 Supersedes N78-22376 (16 - 13, p 1705) Sponsored by NASA

(NASA-Case-NPO-14163-1; US-Patent-4,222,098; US-Patent-Appl-SN-878541; US-Patent-Class-363-71; US-Patent-Class-363-56; US-Patent-Class-363-78) Avail: US Patent and Trademark Office CSCL 09C

In a paralleled inverter system, a positive feedback current derived from the total current from all of the modules of the inverter system is applied to the base drive of each of the power transistors of all modules, thereby to provide all modules protection against open or short circuit faults occurring in any of the modules, and force equal current sharing among the modules during turn on of the power transistors.

Official Gazette of the U.S. Patent and Trademark Office



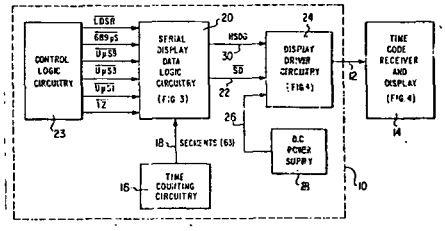
N81-14221* National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.

SYSTEM FOR A DISPLAYING AT A REMOTE STATION DATA GENERATED AT A CENTRAL STATION AND FOR POWERING THE REMOTE STATION FROM THE CENTRAL STATION Patent

James C. Perry, inventor (to NASA) Issued 14 Oct. 1980 9 p Filed 30 Nov. 1978 Supersedes N79-14308 (17 - 05, p 0590)

(NASA-Case-GSC-12411-1; US-Patent-4,228,422; US-Patent-Appl-SN-965367; US-Patent-Class-340-310A; US-Patent-Class-340-309.4; US-Patent-Class-340-310R; US-Patent-Class-340-870.24; US-Patent-Class-370-85; US-Patent-Class-368-47) Avail: US Patent and Trademark Office CSCL 09C

A system for displaying at a remote station data generated at a central station and for powering the remote station from the central station is presented. A power signal is generated at the central station and time multiplexed with the data and then transmitted to the remote station. An energy storage device at the remote station is responsive to the transmitted power signal to provide energizing power for the circuits at the remote station during the time interval data is being transmitted to the remote station. Energizing power for the circuits at the remote station is provided by the power signal itself during the time this signal is transmitted. Preferably the energy storage device is a capacitor which is charged by the power signal during the time the power is transmitted and is slightly discharged during the time the data is transmitted to energize the circuits at the remote station. Official Gazette of the U.S. Patent and Trademark Office



N81-15192* National Aeronautics and Space Administration. Pasadena Office, Calif.

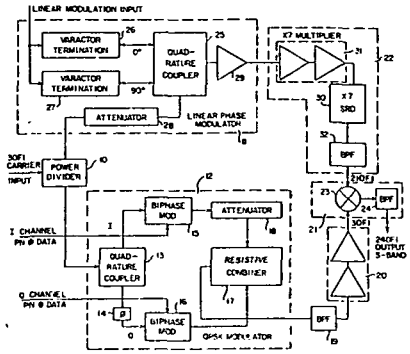
METHOD AND APPARATUS FOR QUADRIPHASE-SHIFT-KEY AND LINEAR PHASE MODULATION Patent

Charles E. Hermesmeyer, inventor (to NASA) (Motorola, Inc., Phoenix, Ariz.) Issued 5 Aug. 1980 5 p Filed 6 Mar. 1979 Supersedes N79-18155 (17 - 09, p 1118) Sponsored by NASA

(NASA-Case-NPO-14444-1; US-Patent-4,216,542; US-Patent-Appl-SN-017890; US-Patent-Class-375-67; US-Patent-Class-375-54; US-Patent-Class-455-102; US-Patent-Class-332-22; US-Patent-Class-332-23R) Avail: US Patent and Trademark Office CSCL 09C

A submultiple of an S-band transmitter output frequency was divided equally between a linear phase modulation branch and a QPSK modulation branch. The linear modulation branch includes a multiplier to increase the carrier frequency to a level which, when combined with the carrier in the QPSK branch in an up-converter (utilizing a mixer at the input followed by a bandpass filter), produces the transmitter output frequency. This allows the QPSK modulator to operate at one-eighth of the output frequency where repeatable and precisely controlled modulation can be easily achieved. This also allows linear phase modulation at one-eighth the output frequency where low

modulator deviation and good linearity can be easily maintained. Official Gazette of the U.S. Patent and Trademark Office



N81-15194*# National Aeronautics and Space Administration. Pasadena Office, Calif.

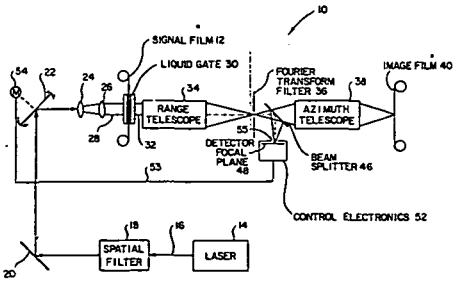
AN ELECTRO-OPTICAL DOPPLER TRACKER MEANS AND METHOD FOR OPTICAL CORRELATION OF SYNTHETIC APERTURE RADAR DATA Patent Application

Nicholas J. Constantinides (JPL) and Thomas J. Bicknell, inventors (to NASA) (JPL) Filed 9 Oct. 1980 16 p

(Contract NAS7-100)

(NASA-Case-NPO-14998-1; US-Patent-Appl-SN-195547) Avail: NTIS HC A02/MF A01 CSCL 17I

A beam splitter is located between a Fourier transform filter and an azimuth telescope for reflecting a portion of a modulated laser beam to a plane containing two photodiodes. The photodiodes are positioned with respect to the reflected laser beam's Gaussian distribution so that they each experience the same light intensity in the absence of a Doppler shift. As Doppler shifts occur, the Gaussian distribution shifts either in one direction or the other, thereby creating unequal light intensities and thus currents in the photodiodes. These unequal intensities are utilized to control the angle that the laser beam intersects the signal film, the angle being adjusted until each photodiode experiences the same light intensity, thereby indicating the absence of a Doppler shift. T.M.



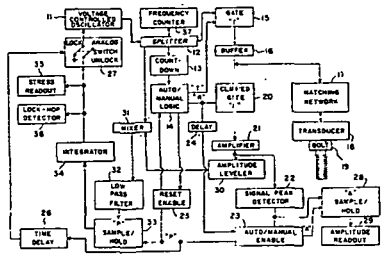
N81-15195*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

PULSED PHASE LOCKED LOOP STRAIN MONITOR Patent Application

Joseph S. Heyman, inventor (to NASA) Filed 23 Oct. 1980 17 p

(NASA-Case-LAR-12772-1; US-Patent-Appl-SN-199767) Avail: NTIS HC A02/MF A01 CSCL 09C

The RF output of a voltage controlled oscillator (VCO) is periodically gated by a gate to a transducer which produces acoustic waves in a bolt. The reflected acoustic waves are converted to electrical signals by a transducer and gated by a gate to a mixer. The mixer also receives the output from the VCO and produces an output which is filtered by a low pass filter. The output of the filter is a dc signal proportional to the phase difference change from a fixed phase difference between the two input signals to the mixer. This dc signal is sampled at an instant and held by a circuit in response to the P signal. The output of the circuit is integrated by an integrator and then applied to the VCO to change the frequency of the VCO such that the phase difference between the two inputs to the mixer remains at said fixed phase difference. The frequency of the VCO is a measure of the change in strain of the bolt. T.M.



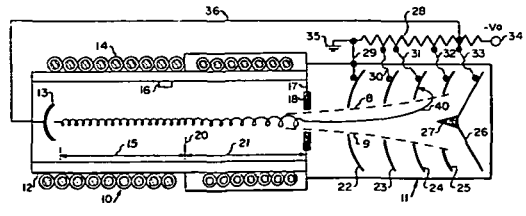
N81-16384*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

GYROTRON TRANSMITTING TUBE Patent Application

Henry G. Kosmahl, inventor (to NASA) Filed 24 Dec. 1980 9 p

(NASA-Case-LEW-13429-1; US-Patent-Appl-SN-220212) Avail: NTIS HC A02/MF A01 CSCL 09A

An R.F. transmitting tube for the 20 GHz to 500 GHz range comprises a gyrotron and a multistage depressed 5 collector. A winding provides a magnetic field which acts on spent, spinning or orbiting electrons changing their motion to substantially forward linear motion in a downstream direction. The spent electrons then pass through a focusser into the collector. Nearly all of the electrons injected into the collector will remain within an imaginary envelope as they travel forward toward the end collector plate. The apertures in the collector plates are at least as large in diameter as the 5 envelope at any particular axial position. NASA



N81-16385*# National Aeronautics and Space Administration. Pasadena Office, Calif.

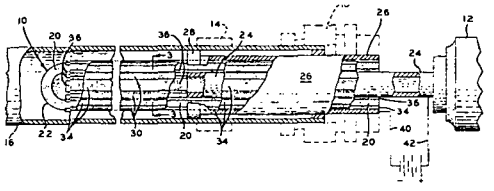
AN IMPROVED SOLID ELECTROLYTE CELL Patent Application

Robert Richter, inventor (to NASA) (JPL) Filed 24 Dec. 1980 14 p

(Contract NAS7-100)

(NASA-Case-NPO-15269-1; US-Patent-Appl-SN-220214) Avail: NTIS HC A02/MF A01 CSCL 09A

A solid electrolyte cell is disclosed which includes a body of solid gas-conductive electrolytes having mutually spaced surfaces on which a number of mutually spaced electrodes are deposited. Strips of bare substrate are interposed between the electrodes so that currents of ionic gas may be established between the electrodes. Electrical resistance for the cells is lowered and the gas conductivity is enhanced. NASA



N81-16386*# National Aeronautics and Space Administration. Pasadena Office, Calif.

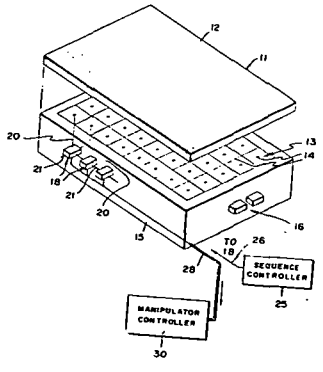
TACTILE SENSING SYSTEM Patent Application

Marc Raibert (JPL, California Inst. of Technology, Pasadena) and Raymond Eskenazi, inventors (to NASA) (JPL, California Inst. of Technology, Pasadena) Filed 16 Jan. 1981 9 p

(Contract NAS7-100)

(NASA-Case-NPO-15094-1; US-Patent-Appl-SN-225500) Avail: NTIS HC A02/MF A01 CSCL 09C

A tactile sensing system comprises a sheet of flexible material on top of a semiconductor layer on which an array of electrodes is formed. Computing elements are present in the layer and are connected via lines to the electrodes, to each other and to an external sequence controller and a manipulator collector. The electrodes, the computing elements and the interconnecting lines are formed by large scale integration, thereby resulting in a relatively small sensor with a dense array of electrodes convertible to the external circuitry by a minimum number of wires. NASA



N81-17348* National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.

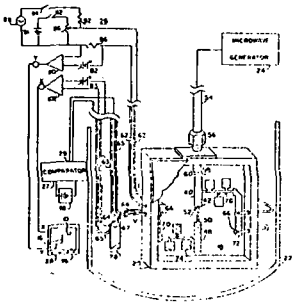
MICROWAVE INTEGRATED CIRCUIT FOR JOSEPHSON VOLTAGE STANDARDS Patent

Louis B. Holdeman (NAS-NRC, Washington, D.C.), Jaan Toots (NAS-NRC, Washington, D.C.), and Chu-Cheng Chang, inventors (to NASA) (NAS-NRC, Washington, D.C.) Issued 7 Oct. 1980 8 p Filed 31 Aug. 1978 Supersedes N78-32347 (16 - 23, p 3074) Sponsored by NASA

(NASA-Case-MFS-23845-1; US-Patent-4,227,096; US-Patent-Appl-SN-938298; US-Patent-Class-307-233R; US-Patent-Class-307-306; US-Patent-Class-333-204) Avail: US Patent and Trademark Office CSCL 09C

A microwave integrated circuit comprised of one or more Josephson junctions and short sections of microstrip or stripline transmission line is fabricated from thin layers of superconducting metal on a dielectric substrate. The short sections of transmission are combined to form the elements of the circuit and particularly, two microwave resonators. The Josephson junctions are located between the resonators and the impedance of the Josephson junctions forms part of the circuitry that couples the two resonators. The microwave integrated circuit has an application in Josephson voltage standards. In this application, the device is asymmetrically driven at a selected frequency (approximately equal to the resonance frequency of the resonators), and a d.c. bias is applied to the junction. By observing the current voltage characteristic of the junction, a precise voltage, proportional to the frequency of the microwave drive signal, is obtained.

Official Gazette of the U.S. Patent and Trademark Office



N81-17349* National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.

DIGITAL NUMERICALLY CONTROLLED OSCILLATOR Patent

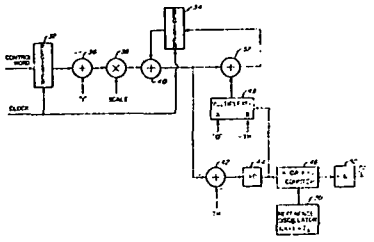
Alfred Cellier (TRW Systems Group, Redondo Beach, Calif.), Douglas C. Huey (TRW Systems Group, Redondo Beach, Calif.), and Lit N. Ma, inventors (to NASA) (TRW Systems Group, Redondo Beach, Calif.) Issued 23 Dec. 1980 8 p Filed 29 Dec. 1978 Supersedes N79-17138 (17 - 08, p 0977) Sponsored by NASA

(NASA-Case-MSC-16747-1; US-Patent-4,241,308; US-Patent-Appl-SN-974475; US-Patent-Class-328-55; US-Patent-Class-328-134; US-Patent-Class-328-37; US-Patent-Class-331-48) Avail: US Patent and Trademark Office CSCL 09A

The frequency and phase of an output signal from an oscillator circuit are controlled with accuracy by a digital input word. Positive and negative alterations in output frequency are both provided for by translating all values of input words so that they are positive. The oscillator reference frequency is corrected only in one direction, by adding phase to the output frequency of the oscillator. The input control word is translated to a single algebraic sign and the digital 1 is added thereto. The translated input control word is then accumulated. A reference clock signal having a frequency at an integer multiple of the desired frequency of the output signal is generated. The accumulated control word is

...ren compared with a threshold level. The output signal is adjusted in a single direction by dividing the frequency of the reference clock signal by a first integer or by an integer different from the first integer.

Official Gazette of the U.S. Patent and Trademark Office



N81-19389* National Aeronautics and Space Administration. Pasadena Office, Calif.

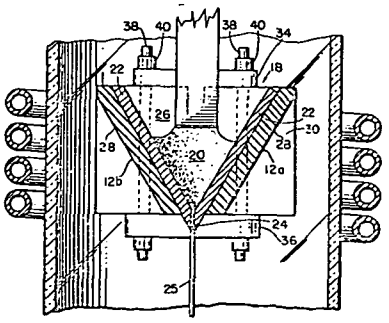
APPARATUS FOR USE IN THE PRODUCTION OF RIBBON-SHAPED CRYSTALS FROM A SILICON MELT Patent

Samuel Berkman (RCA Corp., Princeton, N.J.) and Harold E. Temple, inventors (to NASA) (RCA Corp., Princeton, N.J.) Issued 30 Dec. 1980 6 p Filed 31 Aug. 1978 Supersedes N78-10918 (17-01, p 0122) Sponsored by NASA

(NASA-Case-NPO-14297-1; US-Patent-4,242,553; US-Patent-Appl-SN-938299; US-Patent-Class-219-10.49R; US-Patent-Class-219-10.67; US-Patent-Class-422-246; US-Patent-Class-422-249; US-Patent-Class-156-608; US-Patent-Class-156-DIG.98; US-Patent-Class-432-264) Avail: US Patent and Trademark Office CSCL 09A

A susceptor for facilitating induction heating of silicon melt is described. The susceptor comprises a pair of susceptor halves of a thickness less than two skin depths, each being the mirror image of the other, disposed in mutually opposed, electrically insulated relation. The crucible comprises a quartz body supported by the graphite susceptor, whereby the R-F coil is electrically coupled with the melt.

Official Gazette of the U.S. Patent and Trademark Office



N81-19392* National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.

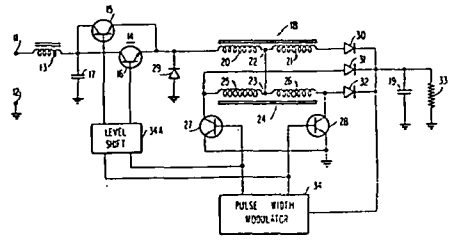
BUCK/BOOST REGULATOR Patent

John Paulkovich and G. Ernest Rodriguez, inventors (to NASA) Issued 13 Jan. 1981 8 p Filed 21 May 1979 Supersedes N79-27394 (17 - 18, p 2399)

(NASA-Case-GSC-12360-1; US-Patent-4,245,286; US-Patent-Appl-SN-041164; US-Patent-Class-363-21; US-Patent-Class-363-101) Avail: US Patent and Trademark Office CSCL 09A

A voltage regulated DC to DC converter uses an inductor and a capacitor as storage elements. The inductor is composed of two windings having a common junction. A transformer with a center tap connected to the common junction of the two windings is connected at either end of its winding to ground through controlled switches. One winding of the inductor and either end of the transformer winding are connected by power diodes to the capacitor which supplies the output voltage to a load. The other winding of the inductor is connected to a fourth power diode as a clamping diode. Input voltage is supplied to the inductor through a third controlled switch. A pulse width modulator connected to the output of the converter alternately closes and opens the switches connected to either end of the transformer winding and also closes the switch supplying input voltage to the inductor each time either of the switches connected to the ends of the transformer winding are closed. The duty cycle of the closing and opening of the several switches is adjusted by the pulse modulator to regulate the output voltage.

Official Gazette of the U.S. Patent and Trademark Office



N81-19393* National Aeronautics and Space Administration. Pasadena Office, Calif.

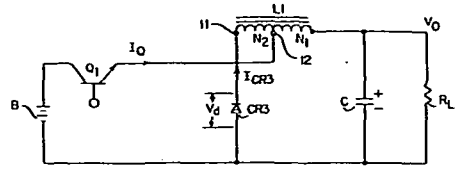
ELIMINATION OF CURRENT SPIKES IN BUCK POWER CONVERTERS Patent

William T. McLyman, inventor (to NASA) (JPL, California Inst. of Technology, Pasadena) Issued 13 Jan. 1981 9 p Filed 31 Oct. 1978 Sponsored by NASA

(NASA-Case-NPO-14505-1; US-Patent-4,245,288; US-Patent-Appl-SN-956166; US-Patent-Class-363-40; US-Patent-Class-363-21; US-Patent-Class-363-36; US-Patent-Class-363-47) Avail: US Patent and Trademark Office CSCL 09C

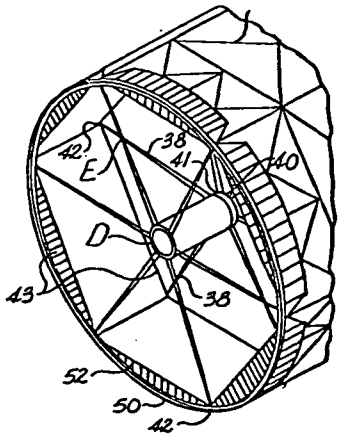
Current spikes in a buck power converter due to commutating diode turn-off time are eliminated by using a tapped inductor in the converter with the tap connected to the switching transistor. The commutating diode is not in the usual place, but is instead connected to conduct current from one end of the tapped inductor remote from the load during the interval in which the transistor is not conducting. In the case of a converter having a center-tapped (primary and secondary) transformer between two switching power transistors operated in a push-pull mode and two rectifying diodes in the secondary circuit, current spikes due to transformer saturation are also eliminated by using a tapped inductor in the converter with the tap connected to the rectifying diodes and a diode connected to conduct current from one end of the tapped inductor remote from the load during the interval in which the transistors are not conducting.

Official Gazette of the U.S. Patent and Trademark Office



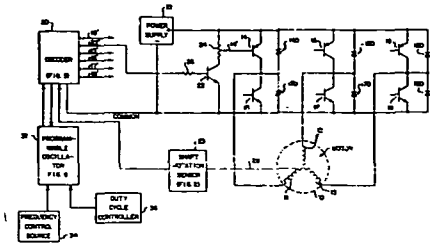
N81-19394*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
ELECTRICAL ROTARY JOINT APPARATUS FOR LARGE SPACE STRUCTURES Patent Application
Robert R. Belew and Richard J. Boehme, inventors (to NASA) Filed 4 Feb. 1981 19 p
(NASA-Case-MFS-23981-1; US-Patent-Appl-SN-231543) Avail: NTIS HC A02/MF A01 CSCL 09C

A structural array and electrical rotary joint for transmitting an electrical power between large space structures having relative rotational movement therebetween is disclosed as including large support framework structures which rotate relative to one another about a common axis of rotation. The arrangement of cylindrical hub members and associated support structure in combination with the electrical conductor and bearings enable transmission of large amounts of electrical power from structures such as a solar array to a microwave antenna while maintaining a high degree of dimensional stability. Author



N81-20352*# National Aeronautics and Space Administration. Pasadena Office, Calif.
CONTROLLER FOR COMPUTER CONTROL OF BRUSHLESS dc MOTORS Patent
Lester S. Hieda, inventor (to NASA) (JPL, California Inst. of Tech., Pasadena) Issued 3 Feb. 1981 23 p Filed 23 Mar. 1979 Supersedes N79-20315 (17 - 11, p 1421) Sponsored by NASA
(NASA-Case-NPO-13970-1; US-Patent-4,249,116; US-Patent-Appl-SN-023484; US-Patent-Class-318-254; US-Patent-Class-318-138; US-Patent-Class-318-439) Avail: US Patent and Trademark Office CSCL 09C

A motor speed and torque controller for brushless dc motors provides an unusually smooth torque control arrangement. The controller provides a means for controlling a current waveform in each winding of a brushless dc motor by synchronization of an excitation pulse train from a programmable oscillator. Sensing of torque for synchronization is provided by a light beam chopper mounted on the motor rotor shaft. Speed and duty cycle are independently controlled by controlling the frequency and pulse width output of the programmable oscillator. A means is also provided so that current transitions from one motor winding to another is effected without abrupt changes in output torque.
Official Gazette of the U.S. Patent and Trademark Office



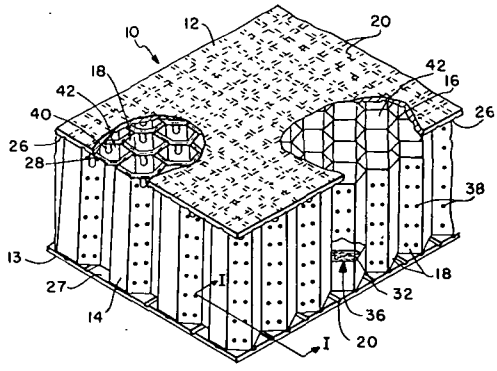
34 FLUID MECHANICS AND HEAT TRANSFER

Includes boundary layers; hydrodynamics; fluidics; mass transfer; and ablation cooling.

For related information see also *02 Aerodynamics* and *77 Thermodynamics and Statistical Physics.*

N81-12362*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
HEAT PIPE HONEYCOMB PANEL Patent Application
Charles J. Camarda and H. Neale Kelly, inventors (to NASA) Filed 3 Sep. 1980 12 p
(NASA-Case-LAR-12637-1; US-Patent-Appl-SN-183706) Avail: NTIS HC A02/MF A01 CSCL 20D

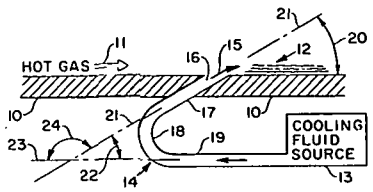
A thermally inert structural panel, having low thermal resistance normal to its sheets, and a high strength-to-weight ratio is described. A honeycomb lattice was sealed from the environment between upper and lower sheets, the inner surfaces which have grooves and are saturated with a working fluid. Openings which include slots and notches, may be contained within the honeycomb lattice for intercell flow of the working fluid within the panel. Heating one sheet of the panel evaporates working fluid on that plate which then condenses on other surfaces within the panel. The condensed fluid is returned to the evaporating plate by capillary flow. NASA



N81-12363*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
CURVED FILM COOLING ADMISSION TUBE Patent Application
R. W. Graham and S. S. Papell, inventors (to NASA) Filed 27 Oct. 1980 12 p
(NASA-Case-LEW-13174-1; US-Patent-Appl-SN-200634) Avail: NTIS HC A02/MF A01 CSCL 20D

Effective film cooling to protect a wall surface from a hot fluid which impinges on or flows along the surface is proposed. A film of cooling fluid having increased area is provided by changing the direction of a stream of cooling fluid through an angle of from 135 degrees to 165 degrees before injecting it through the wall into a hot flowing gas at an angle to form a cooling fluid film. Cooling fluid is supplied to the orifice from a cooling fluid source via a turbulence control passageway having a curved portion between two straight portions. The angle through which the direction of the cooling fluid is turned results in less

mixing of the cooling fluid with the hot gas, thereby substantially increasing the length of the film in a downstream direction.
NASA



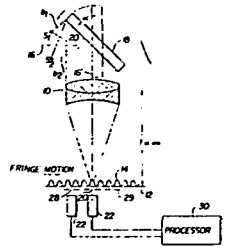
35 INSTRUMENTATION AND PHOTOGRAPHY

Includes remote sensors; measuring instruments and gages; detectors; cameras and photographic supplies; and holography.

For aerial photography see *43 Earth Resources*. For related information see also *06 Aircraft Instrumentation*, and *19 Spacecraft Instrumentation*.

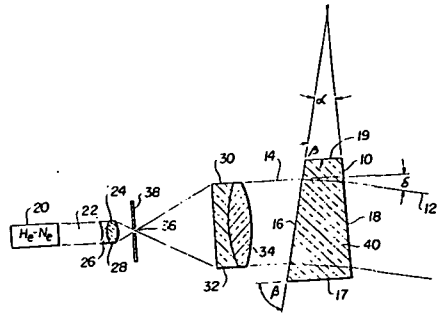
N81-12386*# National Aeronautics and Space Administration. *Goddard Space Flight Center, Greenbelt, Md.*
INTERFEROMETRIC ANGLE MONITOR Patent Application
Peter O. Minott, inventor (to NASA) Filed 8 Oct. 1980 11 p
(NASA-Case-GSC-12614-1; US-Patent-Appl-SN-195227) Avail: NTIS HC A02/MF A01 CSCL 14B

Two mutually coherent light beams formed from a single monochromatic light source and were directed to a reflecting surface of a rotatable object. They were reflected into an imaging optical lens having a focal plane optically at infinity. A series of interference fringes were formed in the focal plane which were translated linearly in response to angular rotation of the object. Photodetectors were located adjacent the focal plane to detect the fringe translation and output a signal in response to the translation. The signal was fed to a signal processor which was adapted to count the number of fringes detected and develop a measure of the angular rotation and direction of the object.
NASA



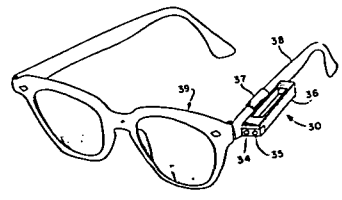
N81-12387*# National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
MULTIPRISM COLLIMATOR Patent Application
Peter O. Minott, inventor (to NASA) Filed 8 Oct. 1980 13 p
(NASA-Case-GSC-12608-1; US-Patent-Appl-SN-195228) Avail: NTIS HC A02/MF A01 CSCL 14B

A special purpose optical collimator system which generates multiple collimated light beams, with precisely related angular separation of the beams is described. The system is comprised of a stack of relatively flat plate like refracted prisms in the form of wedges, each having a specified angular deviation, mounted on top of one another in a fixture which holds the wedges so that they are adapted to operate at minimum angular deviation and thus are relatively insensitive to rotational and angular changes. A collimated source of monochromatic light generated, for example, by a helium neon laser and a collimated beam expander provides a common incident beam to the wedges whereupon a plurality of, for example, equally spaced emergent beams are provided.
NASA



N81-12388*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
MINIATURE SPECTRALLY SELECTIVE DOSIMETER Patent Application
Richard R. Adams, Ian O. MacConochie, inventors (to NASA), and Bordie D. Poole, Jr. Filed 8 Oct. 1980 12 p
(NASA-Case-LAR-12469-1; US-Patent-Appl-SN-195223) Avail: NTIS HC A02/MF A01 CSCL 14B

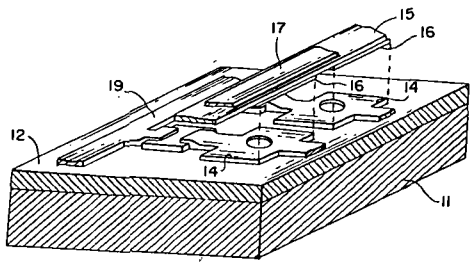
A miniature spectrally selective dosimeter capable of measuring selected bandwidths of radiation exposure on small mobile areas is proposed. The dosimeter is a combination of photovoltaic detectors, electrochemical integrators (E-cells) and filters in a compact case which is easily attached close to and substantially parallel to the surface being measured. In one embodiment two photovoltaic detectors, two E-cells amd three filters are packaged in a small case with attaching means consisting of a clip to clip over a side piece of an eye glass frame. In a further embodiment, the electro-optic elements are packaged in a wristwatch case with attaching means being a watchband. The filters in all embodiments allow only selected wavelengths of radiation to be detected by the photovoltaic detectors and then integrated by the E-cells.
NASA



N81-12389*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
PYROELECTRIC DETECTOR ARRAYS Patent Application
Archibald L. Fripp, inventor (to NASA) Filed 29 Sep. 1980 8 p
(NASA-Case-LAR-12363-1; US-Patent-Appl-SN-191748) Avail: NTIS HC A02/MF A01 CSCL 14B

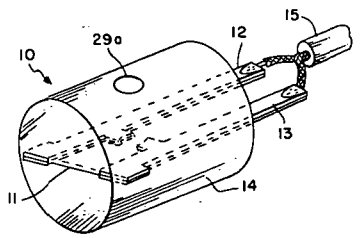
A pyroelectric detector array and the method for making it is described. A series of holes formed through a silicon dioxide

layer on the surface of a silicon substrate forms the mounting fixture for the pyroelectric detector array. A series of nontouching strips of indium are formed around the holes to make contact with the backside electrodes and form the output terminals for individual detectors. A pyroelectric detector strip with front and back electrodes is mounted over the strips. Biasing resistors are formed on the surface of the silicon dioxide layer and connected to the strips. A metallized pad formed on the surface of layer is connected to each of the biasing resistors and to the film to provide the ground for the pyroelectric detector array. NASA



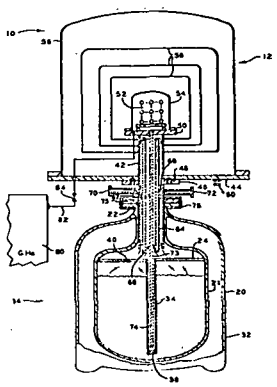
N81-12390*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
HOT FOIL TRANSDUCER SKIN FRICTION SENSOR Patent Application
Thomas Vranas, inventor (to NASA) Filed 14 Aug. 1980 12 p
(NASA-Case-LAR-12321-1; US-Patent-Appl-SN-178195) Avail: NTIS HC A02/MF A01 CSCL 14B

An improved hot wire transducer skin friction sensor is described. The device utilizes foil transducers with only one edge exposed to the fluid flow. The surfaces are polished producing a foil transducer that does not generate turbulence while sufficiently thick to carry the required electrical current for high temperature fluid flow. The assembly utilized a precut layered metal sandwich with attached electrodes eliminating a need for welding and individual sensor calibration. NASA



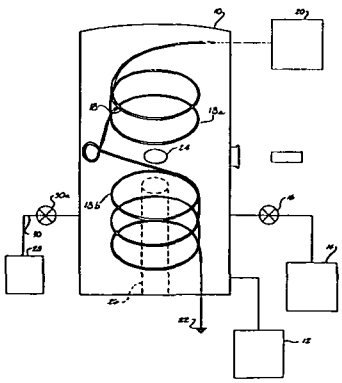
N81-14287* National Aeronautics and Space Administration. Pasadena Office, Calif.
LOW COST CRYOSTAT Patent
James B. Stephens, inventor (to NASA) (JPL) Issued 26 Aug. 1980 9 p Filed 29 Mar. 1979 Supersedes N79-20283 (17-11, p 1417) Sponsored by NASA
(NASA-Case-NPO-14513-1; US-Patent-4,218,892; US-Patent-Appl-SN-025162; US-Patent-Class-62-514R; US-Patent-Class-165-105) Avail: US Patent and Trademark Office CSCL 14B

A cryostat for use in a low or a substantially gravity-free environment adapted to cool an experiment through the use of helium 2, or helium in its super fluid state is characterized by a number of interchangeable daughter dewars and helium supply or mother dewar. A low pressure venting system is provided for converting helium contained in the mother dewar to a superfluid state for use as a primary cryogen. Each daughter dewar is adapted to be removably mounted in mated relation on the mother dewar and is characterized by support for an experiment package, a source of helium to be employed as a secondary cryogen. A heat pipe is suspended from each daughter dewar and adapted to be extended into the mother dewar for facilitating cooling of the secondary cryogen. A transfer of heat from the package to the primary cryogen, via the secondary cryogen, is accommodated as a film flow of helium 2 progresses from the heat pipe to the experiment dewar.
Official Gazette of the U.S. Patent and Trademark Office



N81-16427*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
CONTAINERLESS MELTING AND RAPID SOLIDIFICATION APPARATUS AND METHOD Patent Application
William A. Oran, inventor (to NASA) Filed 8 Dec. 1980 9 p
(NASA-Case-MFS-25305; US-Patent-Appl-SN-214360) Avail: NTIS HC A02/MF A01 CSCL 14B

A specimen in a closed environment is suspended in a levitating field, melted, and then cooled and solidified by the injection of a quench gas. The apparatus disclosed employs an electromagnetic levitation system and housing which is evacuated by a vacuum pump or supplied with a controlled amount of argon gas from a source through a valve. The levitation system has a coil made of copper tubing and is connected to an induction generator. A supply of quench gas is connected to the housing by a line and valve. After a levitated specimen is melted, quenching gas of high thermal conductivity is rapidly introduced. This raises the pressure from 40 to 400 Torr, which quickly cools and solidifies the specimen. NASA



N81-19426* National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.

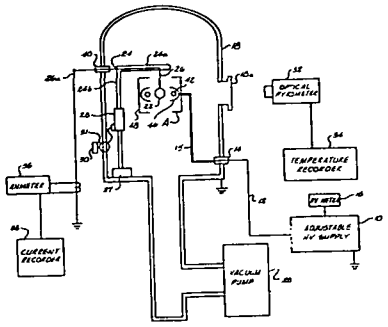
CONTAINERLESS HIGH TEMPERATURE CALORIMETER APPARATUS Patents

Lewis L. Lacy and Daniel B. Nisen, inventors (to NASA) 3 Feb. 1981 6 p Filed 29 Jun. 1979 Supersedes N79-29492 (17 - 20, p 2677)

(NASA-Case-MFS-23923-1; US-Patent-4,248,083; US-Patent-Appl-SN-053569; US-Patent-Class-73-190R) Avail: US Patent and Trademark Office CSCL 14B

A calorimeter apparatus for measuring high temperature thermophysical properties of materials is disclosed which includes a containerless heating apparatus in which the specimen is suspended and heated by electron bombardment.

Official Gazette of the U.S. Patent and Trademark Office



N81-19427* National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.

SELF-CALIBRATING THRESHOLD DETECTOR Patent

James R. Barnes (TRW Systems Group, Redondo Beach, Calif.) and Marshall Y. Huang, inventors (to NASA) (TRW Systems Group, Redondo Beach, Calif.) Issued 23 Dec. 1980 7 p Filed 27 Jul. 1979 Supersedes N80-10413 (18 - 01, p 0057) Sponsored by NASA

(NASA-Case-MSC-16370-1; US-Patent-4,241,312; US-Patent-Appl-SN-061556; US-Patent-Class-329-50; US-Patent-Class-329-107; US-Patent-Class-375-1; US-Patent-Class-375-34; US-Patent-Class-375-99; US-Patent-Class-375-104) Avail: US Patent and Trademark Office CSCL 14B

A self calibrating threshold detector comprises a single demodulating channel which includes a mixer having one input receiving the incoming signal and another input receiving a local replica code. During a short time interval, an incorrect local code is applied to the mixer to incorrectly demodulate the incoming signal and to provide a reference level that calibrates the noise propagating through the channel. A sample and hold circuit is coupled to the channel for storing a sample of the reference level. During a relatively long time interval, the correct replica code provides an output level which ranges between the reference level and a maximum level that represents incoming signal presence and synchronism with the replica code. A summer substracts the stored sample reference from the output level to provide a resultant difference signal indicative of the acquisition of the expected signal.

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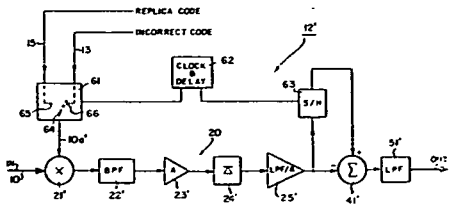


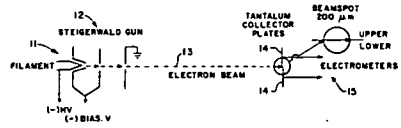
N81-19428*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

A LOW ENERGY ELECTRON MAGNETOMETER Patent Application

Jag J. Singh, George M. Woods, Jr., Grayson Rayborn, H. (Univ. of Southern Mississippi, Hattiesburg), and Frederick A. White, inventors (to NASA) (Renssaelaer Polytechnic Inst.) Filed 26 Nov. 1980 18 p

(NASA-Case-LAR-12706-1; US-Patent-Appl-SN-210498) Avail: NTIS HC A02/MF A01 CSCL 14B

A low energy electron beam magnetometer is described that utilizes near monoenergetic electrons thereby reducing errors due to electron energy spread and electron nonuniform angular distribution. Atoms in an atomic beam of an inert gas are excited to a Rydberg state and then electrons of near zero energy are detached from the Rydberg atoms. The near zero energy electrons are then accelerated by an electric field to form the electron beam. In a second embodiment of the invention a filament emits electrons into an electrostatic analyzer which selects electrons at a predetermined energy level within a very narrow range. These selected electrons make up the electron beam that is subjected to the magnetic field being measured. Author



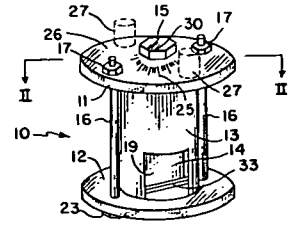
N81-19429*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

FIXTURE FOR ENVIRONMENTAL EXPOSURE OF STRUCTURAL MATERIALS UNDER COMPRESSION Patent Application

Ronald K. Clark and W. Barry Lisagor, inventors (to NASA) Filed 26 Nov. 1980 11 p

(NASA-Case-LAR-12602-1; US-Patent-Appl-SN-210506) Avail: NTIS HC A02/MF A01 CSCL 14B

A device for stressing a deformable materials specimen consists of a top plate and a bottom plate sandwiching a guide cylinder. The specimen is positioned on the bottom plate and attached to a load piston. Force is applied through the top plate into the guide cylinder. Once the specimen is been loaded, the stress is maintained by tightening tie bolt nuts. NASA



N81-19430*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.

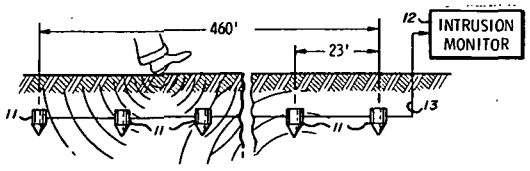
INTRUSION DETECTION METHOD AND APPARATUS Patent Application

Robert D. Lee, inventor (to NASA) Filed 28 Jan. 1981 15 p

(NASA-Case-ARC-11317-1; US-Patent-Appl-SN-229231) Avail: NTIS HC A02/MF A01 CSCL 14B

A system for monitoring unwanted subterranean entries and departures from a secure and for locating and intrusion includes an array of seismic sensors arranged along a perimeter to be monitored. Two wires lead from each sensor to a central monitoring station which has three modes of operation. In the

first mode, the output of all the seismic sensors is summed into a receiver for amplification and detection. In the second mode, the individual output signals from the sensors are multiplexed into the receiver via scanner and gates for sequentially interrogating each of the sensors. The third operating mode permits the operator to manually scan up and down the individual sensors. In this manner a more precise location of the intrusion is obtained. An automatic gain control is provided for the receiver allowing the sensitivity of the receiver to be automatically adjusted for optimum sensitivity with changes in background noise level.
NASA

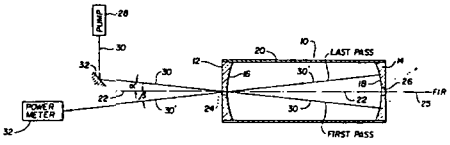


36 LASERS AND MASERS

Includes parametric amplifiers.

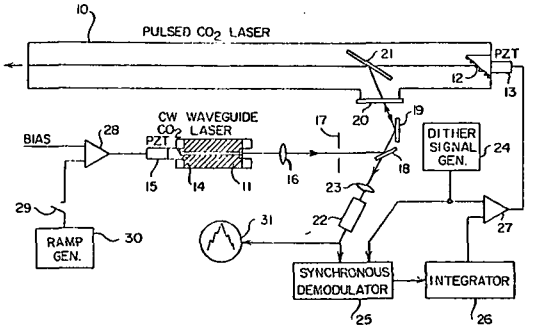
N81-12407*# National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
OFF-AXIS COHERENTLY PUMPED LASER Patent Application
Gerhard A. Koepf, inventor (to NASA) (Phoenix Corp.) Filed 23 Oct. 1980 16 p Sponsored by NASA
(NASA-Case-GSC-12592-1; US-Patent-Appl-SN-199766) Avail: NTIS HC A02/MF A01 CSCL 20E

A coherently optically pumped laser system is described. A pump laser beam propagates through a laser medium contained in a degenerate cavity resonator in a controlled multiple round trip fashion in such a way that the unused pump beam emerges from an injection aperture at a different angle from which it enters the resonator. The pump beam is angularly injected off of the central axis of the resonator body whereupon the pump beam alternately undergoes spreading and focusing while pumping the laser medium by a process of resonant absorption. The emergent pump beam can also be used as a second pump beam source by being reinjected back into the cavity or it can be used for pumping another laser.
NASA



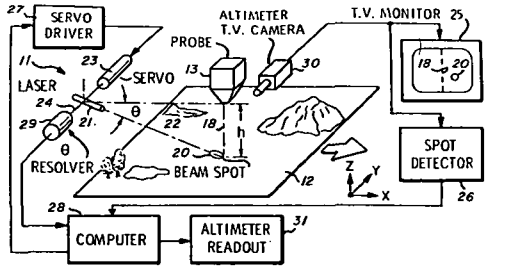
N81-15350*# National Aeronautics and Space Administration. Pasadena Office, Calif.
TUNABLE INJECTION-LOCKED PULSED CO2 LASER Patent Application
Gerard J. Megie (JPL, California Inst. of Tech., Pasadena) and Robert T. Menzies, inventors (to NASA) (JPL, California Inst. of Tech., Pasadena) Filed 26 Nov. 1980 18 p
(Contract NAS7-100)
(NASA-Case-NPO-14984-1; US-Patent-Appl-SN-210490) Avail: NTIS HC A02/MF A01 CSCL 20E

A tunable injection locked pulsed CO2 laser receives energy from a CW waveguide laser tuned by a grating to a desired lasing frequency, and fine tuned on either side of the frequency selected by a piezoelectric transducer which adjusts the cavity length of the laser. A grating of the laser is adjusted to the same lasing frequency of the laser. A synchronous demodulator and integrator are provided in a servo loop to maintain the pulsed laser to the tuned frequency set by the injected energy. The synchronous demodulator servo signal is applied to a piezoelectric transducer that adjusts the resonant cavity length of the pulsed gas laser.
NASA



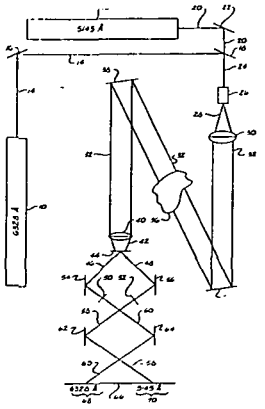
N81-19439*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.
SIDELOOKING LASER ALTIMETER FOR A FLIGHT SIMULATOR Patent Application
Larry D. Webster, inventor (to NASA) Filed 13 Feb. 1981 29 p
(NASA-Case-ARC-11312-1; US-Patent-Appl-SN-234244) Avail: NTIS HC A03/MF A01 CSCL 20E

A laser altimeter for a flight simulator which allows measurement of the height of the simulator probe above the terrain directly below the probe tip is disclosed. A laser beam is directed from the probe at an angle to the horizontal to produce a beam spot on the terrain. The angle that the laser beam makes with the horizontal is varied so as to bring the beam spot into coincidence with a plumb line coaxial with the longitudinal axis of the probe. A television altimeter camera observes the beam spot and has a raster line aligned with the plumb line. Spot detector circuit coupled to the output of the TV camera monitors the position of the beam spot relative to the plumb line. An error signal is produced by computer driving, via a servo motor, the laser beam optics so as to cause the beam spot coincidence with the plumb line. At coincidence, computer looks up in a table the altitude of the probe for the given angle and reads out the altitude to an altimeter readout.
Author



N81-19440*# National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
DUAL LASER OPTICAL SYSTEM AND METHOD FOR STUDYING FLUID FLOW Patent Application
Robert B. Owen and William K. Witherow, inventors (to NASA) Filed 12 Jan. 1981 9 p
(NASA-Case-MFS-25315-1; US-Patent-Appl-SN-224232) Avail: NTIS HC A02/MF A01 CSCL 20E

A dual laser optical system and method is disclosed for visualization of phenomena in transparent substances which induce refractive index gradients such as fluid flow and pressure and temperature gradients in fluids and gases. Two images representing mutually perpendicular components of refractive index gradients are viewed simultaneously on screen. Two lasers having wave lengths in the visible range but separated by about 1000 angstroms are utilized to provide beams which are collimated into a beam containing components of the different wave lengths. The collimated beam is passed through a test volume of the transparent substance. The collimated beam is then separated into components of the different wave lengths and focused on to a pair of knife edges arranged mutually perpendicular to produce and project images onto screen. Author

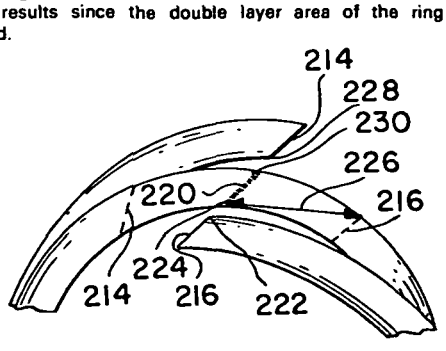


37 MECHANICAL ENGINEERING

Includes auxiliary systems (non-power); machine elements and processes; and mechanical equipment.

N81-12422*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
MODIFIED SPIRAL WOUND RETAINING RING Patent Application
Ashby G. Lawson, inventor (to NASA) Filed 29 Aug. 1980 8 p
(NASA-Case-LAR-12361-1; US-Patent-Appl-SN-182880) Avail: NTIS HC A02/MF A01 CSCL 13E

A spiral wound retaining ring 10 with angled ends 214 and 216 is described. The ring is crimped 220 at the same angle as the ring ends to maintain a constant thickness dimension. The angling of the ends of the ring and crimp allow the ends to be positioned closer together while maintaining enough clearance to enable insertion and removal of the ring. By reducing the separation distance between the ends a stronger ring results since the double layer area of the ring is maximized. NASA



N81-14317* National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.
INSTALLING FIBER INSULATION Patent
David S. Wang (Rockwell International Corp., Downey, Calif.) and Aubrey D. Warren, inventors (to NASA) (Rockwell International Corp., Downey, Calif.) Issued 25 Nov. 1980 4 p Filed 15 Dec. 1978 Supersedes N79-17224 (17-08, p 0988) Sponsored by NASA
(NASA-Case-MSC-16973-1; US-Patent-4,235,060; US-Patent-Appl-SN-969756; US-Patent-Class-52-743; US-Patent-Class-156-294; US-Patent-Class-52-232; US-Patent-Class-150-11) Avail: US Patent and Trademark Office CSCL 11C

A method for installing fragile, high temperature insulation batting in an elongated cavity or in a resilient wire sleeve to form a resilient seal. The batting is preformed to rough dimensions and wrapped in a plastic film, the film being of a material which is fugitive at a high temperature. The film is heat sealed and trimmed to form a snugly fit skin which overlaps at least at one end to permit attachment of a pull cord. The film absorbs the tensile force of pulling the film enclosed batting through the cavity or wire mesh sleeve and is subsequently driven off by high temperature baking, leaving only the insulation in the cavity or wire mesh sleeve.

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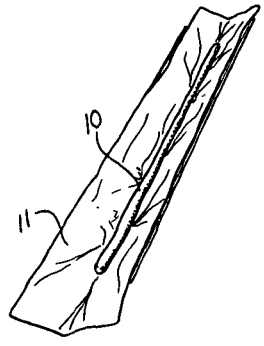
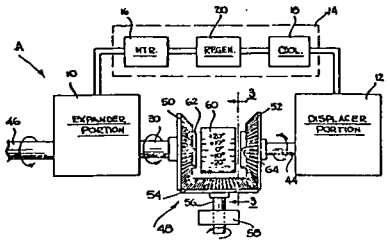


N81-14318* National Aeronautics and Space Administration. Pasadena Office, Calif.
POWER CONTROL FOR HOT GAS ENGINES Patent
William F. MacGlashan, inventor (to NASA) (JPL) Issued 21 Oct. 1980 10 p Filed 19 May 1978 Supersedes N78-25430 (16 - 16, p 2122) Sponsored by NASA
(NASA-Case-NPO-14220-1; US-Patent-4,228,656; US-Patent-Appl-SN-907421; US-Patent-Class-60-518; US-Patent-Class-74-417) Avail: US Patent and Trademark Office CSCL 13I

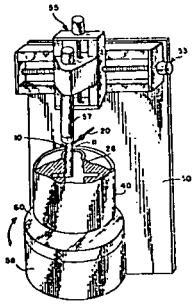
A hot gas engine in which the expander piston of the engine is connected to an expander crankshaft. A displacer piston of the engine is connected to a separate displacer crankshaft which may or may not be coaxial with the expander crankshaft. A phase angle control mechanism used as a power control for changing the phase angle between the expander and displacer crankshaft is located between the two crankshafts. The phase angle control mechanism comprises a differential type mechanism comprised of a pair of gears, as for example, bevel gears, one of which is connected to one end of the expander crankshaft and the other of which is connected to the opposite end of the displacer crankshaft. A mating bevel gear is disposed in meshing engagement with the first two level gears to provide a phase angle control between the two crankshafts. Other forms of differential mechanisms may be used including conventional spur

gears connected in a differential type arrangement.
Official Gazette of the U.S. Patent and Trademark Office



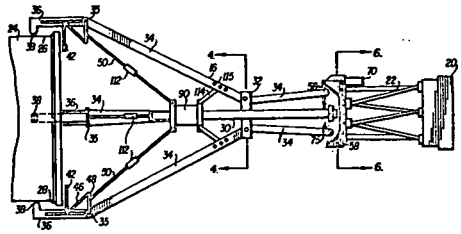
N81-14319* National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.
METHOD AND TOOL FOR MACHINING A TRANSVERSE SLOT ABOUT A BORE Patent
Manuel A. David-Malig, (United Aircraft Corp., Sunnyvale, Calif.) Issued 26 Aug. 1980 6 p Filed 17 Oct. 1978 Supersedes N79-11249 (17 - 02, p. 0168) Sponsored by NASA
(NASA-Case-LAR-11855-1; US-Patent-4,218,941;
US-Patent-Appl-SN-953314; US-Patent-Class-82-1C;
US-Patent-Class-82-1.2; US-Patent-Class-82-36R;
US-Patent-Class-407-85; US-Patent-Class-407-117;
US-Patent-Class-408-1R) Avail: US Patent and Trademark Office CSCL 13I

A method and apparatus for cutting a transverse slot about a bore of smaller diameter than that of the slot are disclosed. The invention consists of introducing a cutting head facing transversely to the bore, through the bore opening its distance from the mill shaft being progressively extended by the addition of spacers between the head and the shaft until the desired slot depth is obtained. The spacers are held in position by a cable passing from the cutting head through the series of spacers and out along the mill shaft. The mill shaft carrying the cutting head is moved transversely into the object wherein the slot is being cut as the object is being rotated thereabout by the mill table to which it is affixed.
Official Gazette of the U.S. Patent and Trademark Office



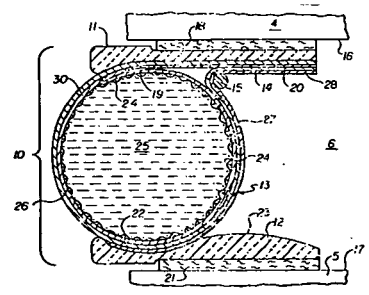
N81-14320* National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.
DEVICE FOR COUPLING A FIRST VEHICLE TO A SECOND VEHICLE Patent
Arthur A. Rudmann, inventor (to NASA) Issued 26 Aug. 1980 10 p Filed 6 Feb. 1979 Supersedes N79-19364 (17-10, p 1285)
(NASA-Case-GSC-12429-1; US-Patent-4,219,171;
US-Patent-Appl-SN-009888; US-Patent-Class-244-161;
US-Patent-Class-294-106; US-Patent-Class-414-1) Avail: US Patent and Trademark Office CSCL 13I

A device is disclosed, carried by a first vehicle such as an orbiting space shuttle, having a plurality of contact members for engaging and holding an annular ring on a second vehicle such as an orbiting payload. The contact members are connected to manipulator arms which are mounted at a fulcrum point and which are moved by an iris type mechanism. Movement of the manipulator arms causes the contact members to grasp or release the annular ring. Bumper devices are provided to axially align the annular ring and draw the contact members into engagement therewith.
Official Gazette of the U.S. Patent and Trademark Office



N81-15363* National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.
THERMAL BARRIER PRESSURE SEAL Patent
John Bellavia, Jr. (Rockwell International Corp., Downey, Calif.) and John O. Kane, inventors (to NASA) (Rockwell International Corp., Downey, Calif.) Issued 26 Aug. 1980 7 p Filed 29 Dec. 1978 Supersedes N79-17225 (17 - 08, p 0989) Sponsored by NASA
(NASA-Case-MSC-18134-1; US-Patent-4,219,203;
US-Patent-Appl-SN-974472; US-Patent-Class-277-181;
US-Patent-Class-277-229) Avail: US Patent and Trademark Office CSCL 11A

An apparatus is described for providing thermal and pressure sealing in an elongated space of varying width between adjacent surface of two members. The apparatus is mounted for at least limited lateral movement between the members and may comprise: an elongated support attached to one of the adjacent surfaces; a second elongated support member attached to the other of the adjacent surfaces, and an elongated seal member sandwiched between the first and second support members. In its non-deformed state, the elongated seal member may be substantially cylindrical but capable of deformation to accommodate limited lateral movement between the adjacent surfaces and varying widths of the space.
Official Gazette of the U.S. Patent and Trademark Office



N81-15364* National Aeronautics and Space Administration. Pasadena Office, Calif.

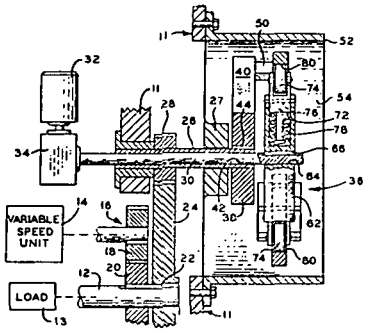
SPEED CONTROL DEVICE FOR A HEAVY DUTY SHAFT Patent

Allen G. Ford, inventor (to NASA) (JPL, California Inst. of Technology, Pasadena) Issued 26 Aug. 1980 6 p Filed 13 Dec. 1977 Supersedes N78-17391 (16 - 08, p 1025) Sponsored by NASA

(NASA-Case-NPO-14170-1; US-Patent-4,219,107; US-Patent-Appl-SN-860404; US-Patent-Class-188-134; US-Patent-Class-188-180; US-Patent-Class-188-184; US-Patent-Class-244-173) Avail: US Patent and Trademark Office CSCL 13I

A speed control device is characterized by a reference speed shaft spatially related to a heavy duty shaft, a drive train for driving the reference speed shaft at a constant angular velocity, a drive train for driving the heavy duty shaft at a variable angular velocity and a speed control assembly for continuously comparing the angular velocity of the heavy duty shaft with the angular velocity of the reference speed shaft. A brake assembly is connected to the heavy duty shaft and is adapted to respond to errors in the angular velocity of the heavy duty shaft in order to reduce the angular velocity of the heavy duty shaft to that of the reference speed shaft.

Official Gazette of the U.S. Patent and Trademark Office



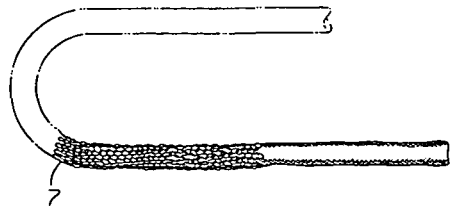
N81-16468*# National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.

A METHOD AND TECHNIQUE FOR INSTALLING LIGHT-WEIGHT FRAGILE, HIGH-TEMPERATURE FIBER INSULATION Patent Application

Bhanu C. Patel, inventor (to NASA) (Rockwell International Corp., Downey, Calif.) Filed 11 Sep. 1980 10 p Sponsored by NASA

(NASA-Case-MSC-16934-2; US-Patent-Appl-SN-185868) Avail: NTIS HC A02/MF A01 CSCL 13I

Light weight insulation batting such as alumina/zirconia or preferably saffil high temperature insulation such as alumina fiber is precut into oversize elongated solution and compressed in a mold to the required thickness or cross sectional dimensions. The saturated batting is then dried in the mold and the resin cured at an appropriate temperature. The resulting rigidized batting may then be machined to the particular required shape and dimensions for installation in wiremesh sleeving or any cavity requiring heat barrier sealing. The entire assembly is subsequently heated to a temperature much greater than the resin curing temperature to effect a clean burn-off of the resin material leaving the original mineral batting material to expand into the interior shape of the containing cavity or wiremesh sleeving if such insulation is to be used as a heat seal around an openable door or hatch in a recoverable space vehicle. NASA



N81-16469*# National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.

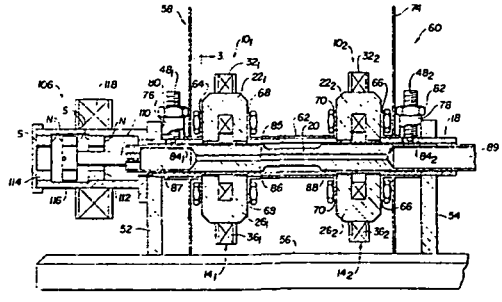
LINEAR MAGNETIC BEARINGS Patent Application

Michael P. Goldowsky, inventor (to NASA) (North American Phillips Corp., Tarrytown, N.Y.) Filed 24 Dec. 1980 18 p Sponsored by NASA

(NASA-Case-GSC-12582-1; US-Patent-Appl-SN-220213) Avail: NTIS HC A02/MF A01 CSCL 13I

A linear armature member is magnetically suspended by a bearing which includes an elongated cylindrical housing having two sets of U-shaped stationary electromagnets and position sensors respectively located at each end of the housing. Each set of electromagnets consists of four electromagnet assemblies 90 deg apart around the periphery of the housing and are operable to generate four orthogonal magnetic fields within the housing. Each set of position sensors is aligned with the electromagnets to define two orthogonal horizontal and vertical axes from which signals proportional to orthogonal shaft displacement are provided. These signals are fed to four separate drive circuits which are adapted to provide signals proportional to shaft positional displacement and velocity within the housing and which generate control signals of the proper amplitude and direction to energize the coal windings in order to axially center the shaft within the housing while maintaining a predetermined stiffness and dampening characteristic. A bumper magnet assembly is located at one end of the housing to dampen any axial displacement of the armature member.

NASA



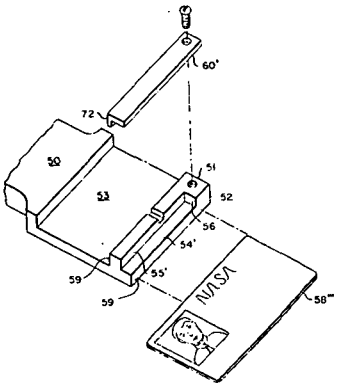
N81-16470*# National Aeronautics and Space Administration. Goddard Space Flight Center, Greenbelt, Md.

HOLDING FIXTURE FOR A HOT STAMPING PRESS Patent Application

Raymond P. Harris, inventor (to NASA) Filed 16 Jan. 1981 15 p

(NASA-Case-GSC-12619-1; US-Patent-Appl-SN-225499) Avail: NTIS HC A02/MF A01 CSCL 13I

A hand held guide for manually positioning a workpiece between the anvil rib and tool of a hot die stamping press is described. A groove completed by interchangable cover plates attached at one end of the guide conforms to a cross sectional dimension common to similar workpieces and, with a force fit, retentively holds each of the workpieces. NASA



N81-17432* National Aeronautics and Space Administration. Pasadena Office, Calif.

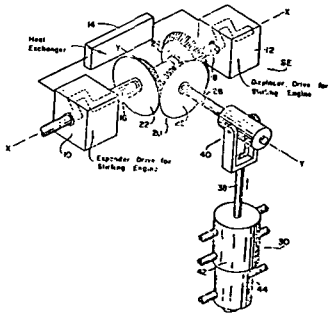
PHASE-ANGLE CONTROLLER FOR STIRLING ENGINES Patent

Allan R. McDougal, inventor (to NASA) (JPL) Issued 23 Dec. 1980 15 p Filed 31 Jan. 1979 Supersedes N79-17217 (17 - 08, p 0987) Sponsored by NASA

(NASA-Case-NPO-14388-1; US-Patent-4,240,256; US-Patent-Appl-SN-008208; US-Patent-Class-60-518; US-Patent-Class-74-417) Avail: US Patent and Trademark Office CSCL 13I

An actuator includes a restraint link adapted to be connected with a pivotal carrier arm for a force transfer gear interposed between the crankshaft for an expander portion of a Stirling engine and a crankshaft for the displacer portion of the engine. The restraint link is releasably trapped hydraulic fluid for selectively establishing a phase angle relationship between the crankshaft. A second embodiment incorporates a hydraulic coupler for use in varying the phase angle of gear-coupled crank fpr a Stirling engine whereby phase angle changes are obtainable.

Official Gazette of the U.S. Patent and Trademark Office



N81-17433* National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.

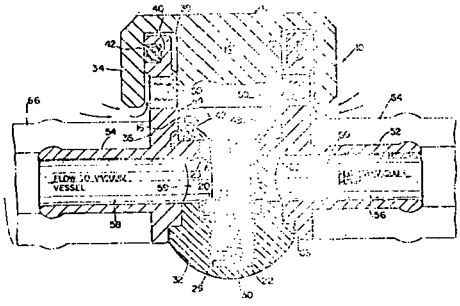
PRESSURE CONTROL VALVE Patent

Kenneth H. Lambson, inventor (to NASA) Issued 16 Dec. 1980 5 p Filed 13 Jul. 1979 Supersedes N79-30553 (17 - 21, p 2817)

(NASA-Case-ARC-11251-1; US-Patent-4,239,057; US-Patent-Appl-SN-057465; US-Patent-Class-137-549; US-Patent-Class-251-339; US-Patent-Class-251-216; US-Patent-Class-128-DIG.20; US-Patent-Class-137-886; US-Patent-Class-137-887) Avail: US Patent and Trademark Office CSCL 13K

A control valve is provided which is adapted to be connected between a pressure source, such as a vacuum pump, and a pressure vessel so as to control the pressure in the vessel. The valve comprises a housing having a longitudinal bore which is connected between the pump and vessel, and a transversely movable valve body which controls the air flow through an air inlet in the housing. The valve body includes cylindrical and conical shaped portions which cooperate with reciprocally shaped portions of the housing to provide flow control. A filter in the air inlet removes foreign matter from the air. The bottom end of the valve body is screwed into the valve housing control knob formed integrally with the valve body and controls translation of the valve body, and the opening and closing of the valve.

Official Gazette of the U.S. Patent and Trademark Office



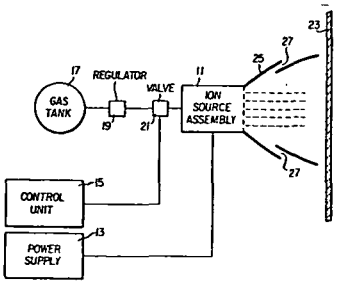
N81-19455* National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

METHOD OF COLD WELDING USING ION BEAM TECHNOLOGY Patent

Bernard L. Sater, inventor (to NASA) Issued 20 Jan. 1981 5 p Filed 28 Jul. 1978 Supersedes N78-28459 (16 - 19, p 2534)

(NASA-Case-LEW-12982-1; US-Patent-4,245,768; US-Patent-Appl-SN-929084; US-Patent-Class-228-116; US-Patent-Class-228-205; US-Patent-Class-204-192E) Avail: US Patent and Trademark Office CSCL 13H

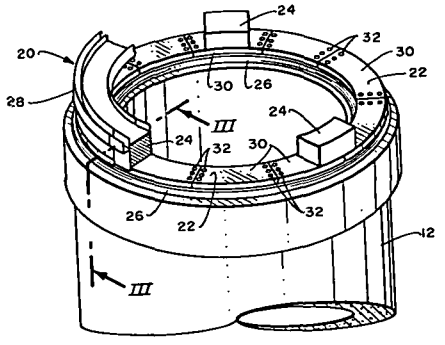
A method for cold welding metal joints is described. In order to remove the contamination layer on the surface of the metal, an ion beam generator is used in a vacuum environment. A gas, such as xenon or argon, is ionized and accelerated toward the metal surface. The beam of gas effectively sputters away the surface oxides and contamination layer so that clean underlying metal is exposed in the area to be welded. The use of this method allows cold welding with minimal deformation. Both similar and dissimilar metals can be cold welded with this method.Official Gazette of the U.S. Patent and Trademark Office



N81-19457*# National Aeronautics and Space Administration. Pasadena Office, Calif.
ANTENNA GROUT REPLACEMENT SYSTEM Patent Application
Charles E. McClung, inventor (to NASA) (JPL) Filed 10 Feb. 1981 16 p
(Contract NAS7-100)
(NASA-Case-NPO-15205-1; US-Patent-Appl-SN-233271) Avail: NTIS HC A02/MF A01 CSCL 13I

An epoxy grout suitable for use in mounting and positioning bearing runner plates used in hydrostatic bearing assemblies for rotatably mounting large radio telescopes structures to stationary support pedestals is described. The epoxy grout may be used in original mountings or may be used as part of a replacement system for repairing cavities in existing grout resulting from grout deterioration. The epoxy grout has a relatively short work life and cure time even in the presence of hydraulic oil. The epoxy grout cures without shrinking or sagging to form a grout which is sufficiently strong and durable to provide a grout especially well suited for use under the high pressure loading and close tolerance requirements of large hydrostatic bearing assemblies.

Author



43 EARTH RESOURCES

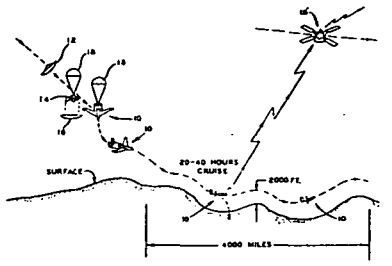
Includes remote sensing of earth resources by aircraft and spacecraft; photogrammetry; and aerial photography.

For instrumentation see *35 Instrumentation and Photography.*

N81-17499* National Aeronautics and Space Administration. Hugh L. Dryden Flight Research Center, Edwards, Calif.
METHOD FOR OBSERVING THE FEATURES CHARACTERIZING THE SURFACE OF A LAND MASS Patent
Robert D. Reed, inventor (to NASA) Issued 23 Dec. 1980 7 p Filed 30 May 1979 Supersedes N79-24979 (17 - 16, p 2073)
(NASA-Case-FRC-11013-1; US-Patent-4,240,601; US-Patent-Appl-SN-043912; US-Patent-Class-244-160; US-Patent-Class-244-49) Avail: US Patent and Trademark Office CSCL 08B

A method is described where a propeller driven, hydrazine powered aircraft is remotely piloted through rarefied atmosphere of a selected planet, including the planet Earth. It is employed as a communication platform for a telemetry system provided for relaying information relating to features characterizing the surface of the planet.

Official Gazette of the U.S. Patent and Trademark Office



44 ENERGY PRODUCTION AND CONVERSION

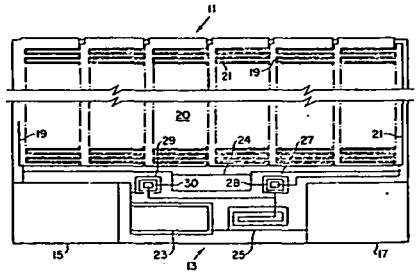
Includes specific energy conversion systems, e.g., fuel cells and batteries; global sources of energy; fossil fuels; geophysical conversion; hydroelectric power; and wind power.

For related information see also *07 Aircraft Propulsion and Power, 20 Spacecraft Propulsion and Power, 28 Propellants and Fuels,* and *85 Urban Technology and Transportation.*

N81-12542* National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
SOLAR CELL SYSTEM HAVING ALTERNATING CURRENT OUTPUT Patent
John C. Evans, Jr., inventor (to NASA) Issued 12 Aug. 1980 6 p Filed 10 Aug. 1979 Continuation-in-part of abandoned US Patent Appl. SN-915050, filed 9 Jun. 1978
(NASA-Case-LEW-12806-2; US-Patent-4,217,633; US-Patent-Appl-SN-065676; US-Patent-Class-363-27; US-Patent-Class-136-249; US-Patent-Class-136-291; US-Patent-Class-363-60; US-Patent-Class-363-147; US-Patent-Appl-SN-915050) Avail: US Patent and Trademark Office CSCL 10A

A monolithic multijunction solar cell was modified by fabricating an integrated circuit inverter on the back of the cell to produce a device capable of generating an alternating current output. In another embodiment, integrated curcuit power conditioning electronics was incorporated in a module containing a solar cell power supply.

Official Gazette of the U.S. Patent and Trademark Office



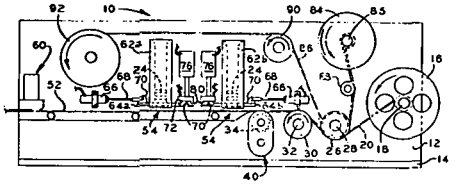
N81-14389* National Aeronautics and Space Administration. Pasadena Office, Calif.

METHOD AND APPARATUS FOR FABRICATING IMPROVED SOLAR CELL MODULES Patent

Joseph T. Bloch (Boeing Aerospace Co., Seattle, Wash.), Randolph T. Hanger (Boeing Aerospace Co., Seattle, Wash.), and Frank W. Nichols, inventors (to NASA) (Boeing Aerospace Co., Seattle, Wash.) Issued 2 Sep. 1980 6 p Filed 23 Feb. 1979 Supersedes N79-18446 (17 - 09, p 1156) Sponsored by NASA (NASA-Case-NPO-14416-1; US-Patent-4,219,926; US-Patent-Appl-Sn-014664; US-Patent-Class-29-832; US-Patent-Class-29-DIG.1) Avail: US Patent and Trademark Office CSCL 10A

A method and apparatus for fabricating an improved solar cell module is described. The apparatus includes a supply drum for feeding a flexible strip having etched electrical circuitry deposited on it a supply drum for feeding into overlying engagement with the flexible strip a flexible tape having a pair of exposed tacky surfaces, and a plurality of rams for receiving and depositing a plurality of solar cells in side-by-side relation on an exposed tacky surface of the tape in electrical contacting engagement with the etched circuitry.

Official Gazette of the U.S. Patent and Trademark Office

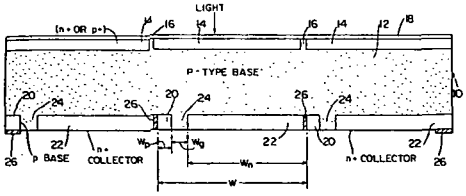


N81-16528*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

HIGH VOLTAGE PLANAR MULTIJUNCTION Patent Application

J. C. Evans, Jr., A. T. Chai, inventors (to NASA), and C. P. Goradia Filed 24 Dec. 1980 15 p (NASA-Case-LEW-13400-1; US-Patent-Appl-SN-219677) Avail: NTIS HC A02/MF A01 CSCL 10A

A solar cell which provides high output voltages, comprises a semiconductor wafer in which a number or array of voltage generating regions or unit cells are formed. Each of the unit cells has two regions of opposite conductivity type (e.g., n+ and p+) which are separated by a gap region. The unit cells are connected together by metal contacts so that their outputs are additive. Field regions, separated by gaps, overlie the unit cells. Cells are formed in both faces of the wafer; a circular wafer is employed. NASA

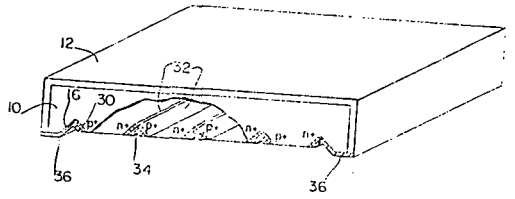


N81-16529*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.

HIGH VOLTAGE V-GROOVE SOLAR CELL Patent Application

John C. Evans, Jr., An-Ti Chai, and Chandra P. Goradia Filed 24 Dec. 1980 11 p (NASA-Case-LEW-13401-1; US-Patent-Appl-SN-219678) Avail: NTIS HC A02/MF A01 CSCL 10A

The fabrication of the cell is described. The solar cell features a plurality of discrete voltage generating regions or unit cells which are formed in a single, generally planar semiconductor body. The unit cells comprise doped regions of opposite conductivity type separated by a gap or indiffused regions. Metal contacts connect adjacent cells together in series so that the output voltages of the individual cells are additive. In some embodiments, doped field regions separated by gaps overlie the unit cells but the cells may be formed in both faces of the wafer. T.M.

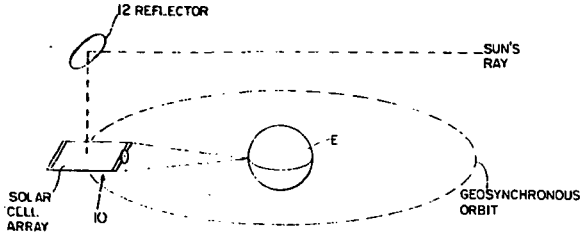


N81-16530*# National Aeronautics and Space Administration, Washington, D. C.

SOLAR POWER SATELLITE SYSTEM Patent Application

George L. Sarver, III, inventor (to NASA) (MIT, Cambridge) Filed 29 Sep. 1980 11 p Sponsored by NASA (NASA-Case-HQN-10949-1; US-Patent-Appl-SN-191747) Avail: NTIS HC A02/MF A01 CSCL 10A

A solar power satellite system is provided which includes a power satellite and at least one reflector satellite. The power satellite, which constitutes the great mass of the system, has a geosynchronous, gravity gradient stabilized orbit. The power satellite comprises a planar array of solar cells, with the plane of the satellite being oriented so as to be parallel with the plane of its orbit. An antenna or antennas mounted on the power satellite are powered by the solar cells and serve to transmit microwave energy back to earth. The shape and orbit of the reflector satellite are controlled so that solar radiation is focused by the reflector satellite onto the solar array of the power satellite. NASA



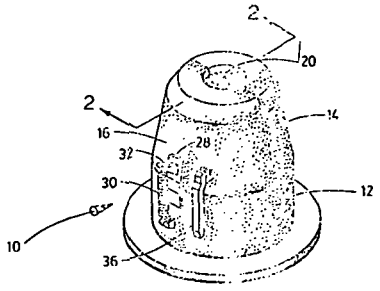
N81-17518* National Aeronautics and Space Administration. Pasadena Office, Calif.

SOLAR ENERGY RECEIVER FOR A STIRLING ENGINE Patent

M. Kudret Selcuk, inventor (to NASA) (JPL) Issued 2 Dec. 1980 5 p Filed 6 Apr. 1979 Supersedes N79-20513 (17 - 11, p 1449) Sponsored by NASA (NASA-Case-NPO-14619-1; US-Patent-4,236,383; US-Patent-Appl-SN-027559; US-Patent-Class-60-641; US-Patent-Class-60-524; US-Patent-Class-126-419) Avail: US Patent and Trademark Office CSCL 10A

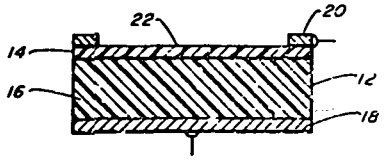
A solar energy receiver includes a separable endless wall formed of a ceramic material in which a cavity of substantially cylindrical configuration is defined for entrapping solar flux. An acceptance aperture is adapted to admit to the cavity a concentrated beam of solar energy. The wall is characterized by at least one pair of contiguously related segments separated by lines of cleavage intercepting the aperture. At least one of the

segments is supported for pivotal displacement. A thermal-responsive actuator is adapted to respond to excessive temperatures within the cavity for initiating pivoted displacement of one segment, whereby thermal flux is permitted to escape from the cavity. Official Gazette of the U.S. Patent and Trademark Office



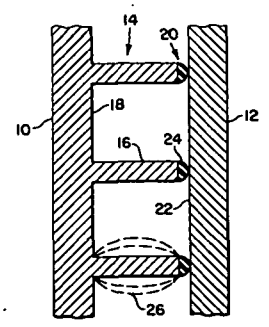
N81-19558* National Aeronautics and Space Administration. Pasadena Office, Calif.
COPPER DOPED POLYCRYSTALLINE SILICON SOLAR CELL Patent
Krishna M. Koliwad (JPL, California Inst. of Tech., Pasadena) and Taher Daud, inventors (to NASA) (JPL, California Inst. of Tech., Pasadena) Issued 10 Feb. 1981 4 p Filed 30 May 1979 Supersedes N79-25512 (17 - 16, p 2147)
(NASA-Case-NPO-14670-1; US-Patent-4,249,957; US-Patent-Appl-SN-043941; US-Patent-Class-136-258; US-Patent-Class-357-30; US-Patent-Class-357-59; US-Patent-Class-357-63; US-Patent-Class-252-62.3E) Avail: US Patent and Trademark Office CSCL 10A

Fabrication of improved performance photovoltaic cells is described. They are fabricated from polycrystalline silicon containing copper segregated at the grain boundaries. T.M.



N81-19561*# National Aeronautics and Space Administration. Lewis Research Center, Cleveland, Ohio.
IMPROVED THERMIONIC ENERGY CONVERTERS Patent Application
James F. Morris, inventor (to NASA) Filed 19 Feb. 1981 11 p
(NASA-Case-LEW-12443-1; US-Patent-Appl-SN-235797) Avail: NTIS HC A02/MF A01 CSCL 10A

The efficiency of thermionic energy converters is improved by reducing plasma losses. This is achieved by internal distribution of tiny shorted cesium diodes driven by the thermal gradient between the primary emitter and the collector. The tiny, shorted diode distribution comprises protrusions of the emitter material from the main emitter face which contact the main collector face thermally but not electrically. The main collector ends of the protrusions are separated from the main collector by a thin layer of insulation, such as aluminum oxide. The diode effect will increase with the use of metals that adsorb cesium less readily for the main emitter ends of the tiny protrusions and metals that adsorb cesium more readily for the main collector ends of the protrusions. Author



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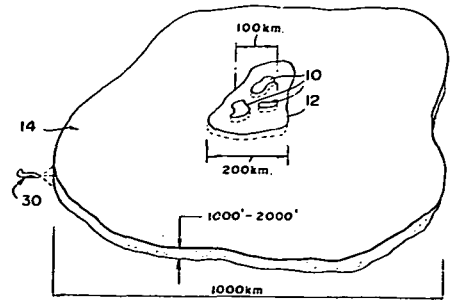
47 METEOROLOGY AND CLIMATOLOGY

Includes weather forecasting and modification.

N81-16677*# National Aeronautics and Space Administration. Pasadena Office, Calif.
CAT ALTITUDE AVOIDANCE SYSTEM Patent Application
Bruce L. Gary, inventor (to NASA) (JPL, California Inst. of Technology, Pasadena) Filed 12 Jan. 1981 21 p
(Contract NAS7-100)
(NASA-Case-NPO-15351-1; US-Patent-Appl-SN-224231) Avail: NTIS HC A02/MF A01 CSCL 04B

A method and apparatus are described for indicating the altitude of the tropopause or of an inversion layer in which clear air turbulence (CAT) may occur and the likely severity of any such CAT. A plot of altitude (with respect to an aircraft) versus temperature of the air at that altitude can indicate when an inversion layer is present and can indicate the altitude of the tropopause or of such an inversion layer. The plot can also indicate the severity of any CAT in an inversion layer. If CAT was detected in the general area, then the aircraft can be flown at an altitude to avoid the tropopause or inversion layer. The detection method can also be utilized to enable an aircraft to fly at an altitude at which the winds are most favorable for reducing fuel consumption. T.M.



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51 LIFE SCIENCES (GENERAL)

Includes genetics.

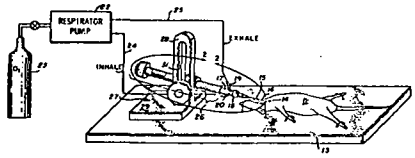
N81-14605* National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.

MICRO-FLUID EXCHANGE COUPLING APPARATUS Patent

John E. Johnson, Jr. (San Francisco Univ.) and Paul F. Swartz, inventors (to NASA) Issued 15 Jul. 1980 6 p Filed 16 Oct. 1978 Supersedes N78-33717 (16 - 24, p 3257)
(NASA-Case-ARC-11114-1; US-Patent-4,212,297; US-Patent-Appl-SN-951422; US-Patent-Class-128-207.14; US-Patent-Class-128-204.18; US-Patent-Class-128-207.28; US-Patent-Class-128-DIG.26; US-Patent-Class-128-236; US-Patent-Class-128-DIG.6; US-Patent-Class-128-DIG.9; US-Patent-Class-128-DIG.12; US-Patent-Class-128-DIG.16) Avail: US Patent and Trademark Office CSCL 06B

In a macro-fluid exchange, a hollow needle, such as a syringe needle, is provided for penetrating the fluid conduit of the animal. The syringe needle is coupled to a plenum chamber having an inlet and outlet port. The plenum chamber is coupled to the syringe needle via the intermediary of a standard quick disconnect coupling fitting. The plenum chamber is carried at the end of a drive rod which is coupled to a micrometer drive head. The micrometer drive head is slidably and pivotably coupled to a pedestal for adjusting the height and angle of inclination of the needle relative to a reference base support. The needle is positioned adjacent to the incised trachea or a blood vessel of a small animal and the micrometer drive head is operated for penetrating the fluid conduit of the animal.

Official Gazette of the U.S. Patent and Trademark Office



52 AEROSPACE MEDICINE

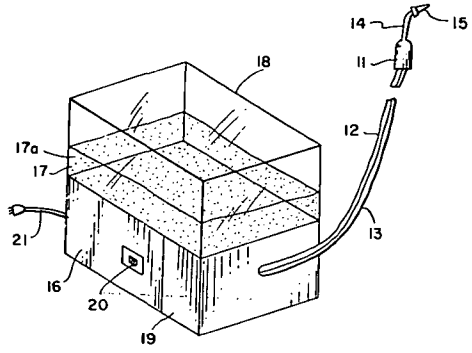
Includes physiological factors, biological effects of radiation; and weightlessness.

N81-12724*# National Aeronautics and Space Administration. Langley Research Center, Hampton, Va.

ACOUSTIC TOOTH CLEANER Patent Application

Joseph S. Heyman, inventor (to NASA) Filed 14 Aug. 1980 13 p
(NASA-Case-LAR-12471-1; US-Patent-Appl-SN-178193) Avail: NTIS HC A02/MF A01 CSCL 06B

An acoustic oral hygiene unit that uses acoustic energy to oscillate mild abrasive particles in a water suspension which is then directed in a low pressure stream onto the teeth is described. The oscillating abrasives scrub the teeth clean removing food particles, plaque, calculous, and other foreign material from tooth surfaces, interproximal areas, and tooth gingiva interface more effectively than any previous technique. The relatively low power output and the basic design make the invention safe and convenient for everyday use in the home without special training. This invention replaces all former means of home dental prophylaxis, and requires no augmentation to fulfill all requirements for daily oral hygienic care. NASA



N81-14612* National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.

SUBCUTANEOUS ELECTRODE STRUCTURE Patent

Gordof F. Lund, inventor (to NASA) (NAS-NRC) Issued 26 Aug. 1980 5 p Filed 16 Jan. 1979 Supersedes N79-15576 (17-06, p 0765) Sponsored by NASA
(NASA-Case-ARC-11117-1; US-Patent-4,219,027; US-Patent-Appl-SN-003693; US-Patent-Class-128-642) Avail: US Patent and Trademark Office CSCL 06B

A subcutaneous electrode structure suitable for a chronic implant and for taking a low noise electrocardiogram of an active animal, comprises a thin inflexible, smooth disc of stainless steel having a diameter as of 5 to 30 mm, which is sutured in place to the animal being monitored. The disc electrode includes a radially directed slot extending in from the periphery of the disc for approximately 1/3 of the diameter. Electrical connection is made to the disc by means of a flexible lead wire that extends longitudinally of the slot and is woven through apertures in the disc and held at the terminal end by means of a spot welded tab. Within the slot, an electrically insulative sleeve, such as silicone rubber, is placed over the wire. The wire with the sleeve mounted thereon is captured in the plane of the disc and within the slot by means of crimping tabs extending laterally of the slot and over the insulative wire. The marginal lip of the slot area is apertured and an electrically insulative potting material such as silicone rubber, is potted in place overlaying the wire slot region and through the apertures.

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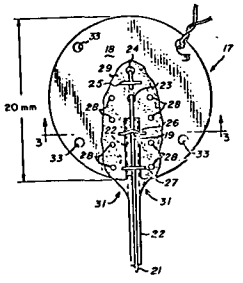


N81-14613* National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.

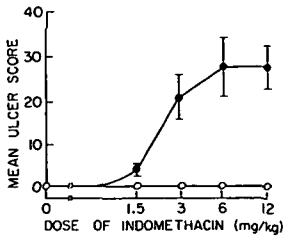
INDOMETH ACIN-ANTIHISTAMINE COMBINATION FOR GASTRIC ULCERATION CONTROL Patent

Patricia A. Brown (San Jose State Univ.) and Joan Vernikos, inventors (to NASA) (San Jose State Univ.) Issued 28 Oct. 1980 8 p Filed 29 Dec. 1978 Supersedes N79-14755 (17 - 05, p 0646) Continuation-in-part of US Patent Appl. SN-850504, filed 10 Nov. 1977 Sponsored by NASA

(NASA-Case-ARC-11118-2; US-Patent-4,230,717; US-Patent-Appl-SN-974476; US-Patent-Appl-SN-850504; US-Patent-Class-424-274) Avail: US Patent and Trademark Office CSCL 06E

An anti-inflammatory and analgesic composition containing indomethacin and an H2 histamine receptor antagonist in an amount sufficient to reduce gastric distress caused by the indomethacin was developed. Usable antagonists are metiamide and cimetidine.

Official Gazette of the U.S. Patent and Trademark Office



N81-20703*# National Aeronautics and Space Administration. Pasadena Office, Calif.

MULTIFUNCTIONAL TRANSDUCER Patent

Cyril Feldstein (JPL), Gilbert W. Lewis (JPL), Virgil H. Culler (JPL), and Samuel Merrbaum, Inventors (to NASA) (JPL) Issued 10 Feb. 1981 13 p Filed 1 Jun. 1979 Supersedes N79-25737 (17 - 16, p 2176) Sponsored by NASA

(NASA-Case-NPO-14329-1; US-Patent-4,249,417; US-Patent-Appl-SN-044432; US-Patent-Class-73-141A; US-Patent-Class-128-642; US-Patent-Class-128-774) Avail: US Patent and Trademark Office CSCL 06B

Several parameters of a small region of a muscle tissue or other object, can be simultaneously measured using with minimal traumatizing or damage of the object, a trifunctional transducer which can determine the force applied by a muscle fiber, the displacement of the fiber, and the change in thickness of the fiber. The transducer has three legs with inner ends joined together and outer ends formed to piece the tissue and remain within it. Two of the legs are relatively stiff, to measure force applied by the tissue, and a third leg is relatively flexible to measure displacement of the tissue relative to one or both stiff legs, and with the three legs lying in a common plane so that the force and displacement measurements all relate to the same direction of muscle movements. A flexible loop is attached to one of the stiff legs to measure changes in muscle thickness, with the upper end of the loop fixed to the leg and the lower end of the loop bearing against the surface of the tissue and being free to slide on the leg.

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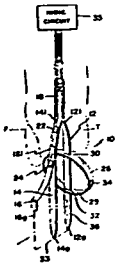


54 MAN/SYSTEM TECHNOLOGY AND LIFE SUPPORT

Includes human engineering; biotechnology; and space suits and protective clothing.

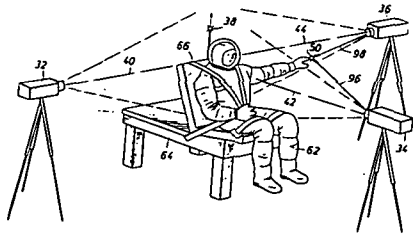
N81-15699*# National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.

KINESIMETRIC METHOD AND APPARATUS Patent Application

William E. Thornton, inventor (to NASA) Filed 17 Oct. 1980 49 p

(NASA-Case-MSC-18929-1; US-Patent-Appl-SN-198093) Avail: NTIS HC A03/MF A01 CSCL 05H

The functional capability of bodies was studied. Reach as well as velocity, acceleration and force generation at various positions was determined for a body by a three dimensional kinesimeter equipped with an ergometer. A general data package *indicative of performance potential of a subject body* or collection of bodies is provided for interfacing with data characteristic of various environments. T.M.



60 COMPUTER OPERATIONS AND HARDWARE

Includes computer graphics and data processing.

For components see *33 Electronics and Electrical Engineering.*

N81-15706* National Aeronautics and Space Administration. Pasadena Office, Calif.

REDUNDANT OPERATION OF COUNTER MODULES Patent

Satoshi Nagano, inventor (to NASA) (JPL, California Inst. of Tech., Pasadena) Issued 15 Jul. 1980 10 p Filed 4 Apr. 1978 Supersedes N78-22347 (16 - 13, p 1705) Sponsored by NASA

(NASA-Case-NPO-14162-1; NASA-Case-NPO-14167-1; NASA-Case-NPO-14169-1; US-Patent-4,213,064; US-Patent-Appl-SN-893903; US-Patent-Class-307-219; US-Patent-Class-307-225R; US-Patent-Class-307-269; US-Patent-Class-307-291; US-Patent-Class-328-48; US-Patent-Class-328-71; US-Patent-Class-328-192) Avail: US Patent and Trademark Office CSCL 09B

A technique for the redundant operation of counter modules is described. Redundant operation is maintained by detecting the zero state of each counter and clearing the other to that state, thus periodically resynchronizing the counters, and obtaining an output from both counters through ac coupled diode-OR gates. Redundant operation of counter flip flops is maintained in a similar manner, and synchronous operation of redundant squarewave clock generators of the feedback type is effected by connecting together the feedback inputs of the squarewave generators through a coupling resistor, and obtaining an output

from both generators through ac coupled diode-OR gates.
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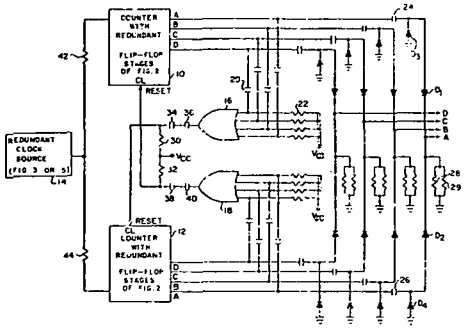

71 ACOUSTICS

Includes sound generation, transmission and attenuation.

For noise pollution see *45 Environment Pollution*.

N81-15767* National Aeronautics and Space Administration. Marshall Space Flight Center, Huntsville, Ala.
METHOD AND APPARATUS FOR SHAPING AND ENHANCING ACOUSTICAL LEVITATION FORCES Patent
William A. Oran, Leroy H. Berge, Donald A. Reiss, and Jerry L. Johnson, inventors (to NASA) Issued 26 Aug. 1980 5 p Filed 13 Jul. 1979 Supersedes N79-29956 (17 - 20, p 2736)
(NASA-Case-MFS-25050-1; US-Patent-4,218,921; US-Patent-Appl-SN-057466; US-Patent-Class-73-505; US-Patent-Class-308-10) Avail: US Patent and Trademark Office CSCL 20A

A method and apparatus for enhancing and shaping acoustical levitation forces in a single-axis acoustic resonance system wherein specially shaped drivers and reflectors are utilized to enhance to levitation force and better contain fluid substance by means of field shaping is described.

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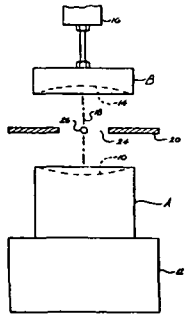
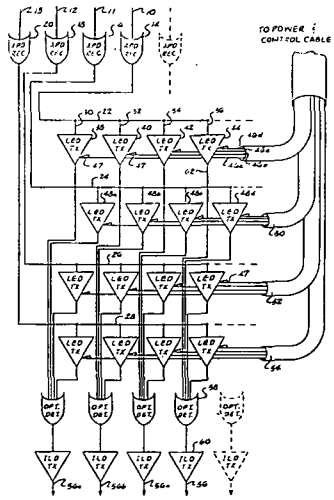


74 OPTICS

Includes light phenomena.

N81-12862*# National Aeronautics and Space Administration. John F. Kennedy Space Center, Cocoa Beach, Fla.
FIBER OPTIC CROSSBAR SWITCH FOR AUTOMATICALLY PATCHING OPTICAL SIGNALS Patent Application
Charles H. Bell, inventor (to NASA) Filed 27 May 1980 16 p (NASA-Case-KSC-11104-1; US-Patent-Appl-SN-153245) Avail: NTIS HC A02/MF A01 CSCL 20F

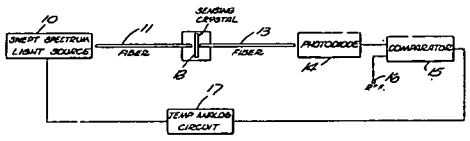
A system for automatically optically switching fiber optic data signals between a plurality of input optical fibers and selective ones of a plurality of output fibers is described. The system includes optical detectors which are connected to each of the input fibers for converting the optic data signals appearing at the respective input fibers to an RF signal. A plurality of RF to optical signal converters are arranged in rows and columns. The output of each of the optical detectors are each applied to a respective row of optical signal converters for being converted back to an optical signal when the particular optical signal converter is selectively activated by a DC voltage. These optical signals are then applied via optical fibers to optical detectors which convert the optical signal back to an RF signal which is used for driving the ILDs. The ILDs, in turn, convert the RF signals back to optical signals without any mechanical switching either of the optical signals or the RF signals. NASA



N81-15818*# National Aeronautics and Space Administration. Lyndon B. Johnson Space Center, Houston, Tex.
OPTICAL CRYSTAL TEMPERATURE GAUGE WITH FIBER OPTIC CONNECTIONS Patent Application
Madan Sharma, inventor (to NASA) (TRW Defense and Space Systems Group, Redondo Beach, Calif.) Filed 12 Sep. 1980 21 p Sponsored by NASA
(NASA-Case-MSC-18627-1; US-Patent-Appl-SN-186881) Avail: NTIS HC A02/MF A01 CSCL 20F

An optical temperature gauge is described which uses a semiconductor crystal that has a band edge shift property which is temperature dependent. An external narrow band light source provides optical excitation through an optical fiber and light energy thus passed through the crystal is conveyed by a second optical fiber to a light to electric transducer at an external location. The crystal is locatable in cryogenic or other systems, to provide remote read out. The light wavelength is varied (scanned) in a repetitive pattern in source and the instantaneous wavelength

passes over the band edge wavelength during each cycle of the scan. The timing of that crossover is related to the temperature of the crystal by electronic means. Several alternative elements of instrumentation are disclosed. A variation in the basic measurement apparatus is also disclosed, in which the band gap voltage of a light source, such as a laser diode, is evaluated at the time of band edge crossover in the crystal and converted to a temperature value. NASA

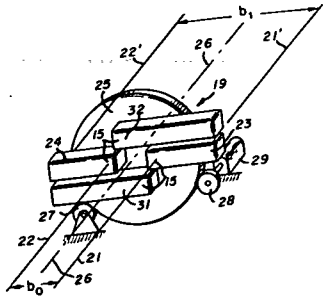


N81-16882*# National Aeronautics and Space Administration. Ames Research Center, Moffett Field, Calif.

RHOMBOID PRISM PAIR FOR ROTATING THE PLANE OF PARALLEL LIGHT BEAMS Patent Application

Kenneth L. Orloff and Haruo Yanagita, inventors (to NASA) (ARO, Inc., Tullahoma, Tenn.) Filed 24 Dec. 1980 10 p (NASA-Case-ARC-11311-1; US-Patent-Appl-SN-219640) Avail: NTIS HC A02/MF A01 CSCL 20E

An optical system for rotating the plane defined by a pair of parallel light beams is described. In one embodiment, a single pair of rhomboid prisms has respective input faces disposed to receive respective input beams. Each prism is rotated about an axis of revolution coaxial with each of the respective input beams by means of a suitable motor and gear arrangement. This causes the plane of the parallel output beams to be rotated relative to the plane of the input beams. In a second embodiment, two pairs of rhomboid 15 prisms are provided. In a first angular orientation of the output beams, two prisms merely serve to decrease the lateral displacement of the output beams in order keep the beams in the same plane as the input beams. In a second angular orientation of the prisms, the input faces of the second pair of prisms are brought into coincidence with the input beams for rotating the plane of the output beams by a substantial angle such as 90 deg. NASA



N81-17886* National Aeronautics and Space Administration. Pasadena Office, Calif.

SYSTEM FOR FORMING A QUADRIFIED IMAGE COMPRISING ANGULARLY RELATED FIELDS OF VIEW OF A THREE DIMENSIONAL OBJECT Patent

Frederick R. Chamberlain, inventor (to NASA) (JPL) Issued 22 Jul. 1980 6 p Filed 20 Mar. 1978 Supersedes N78-22348 (16 - 13, p 1701) Sponsored by NASA (NASA-Case-NPO-14219-1; US-Patent-4,213,684; US-Patent-Appl-SN-888432; US-Patent-Class-354-118; US-Patent-Class-350-301; US-Patent-Class-362-11; US-Patent-Class-362-241) Avail: US Patent and Trademark Office CSCL 20F

A system for generating, within a single frame of photographic film, a quadrified image including images of angularly (including orthogonally) related fields of view of a near field three dimensional object is described. It is characterized by three subsystems each of which includes a plurality of reflective surfaces for imaging a different field of view of the object at a different quadrant of the quadrified image. All of the subsystems have identical path lengths to the object photographed.

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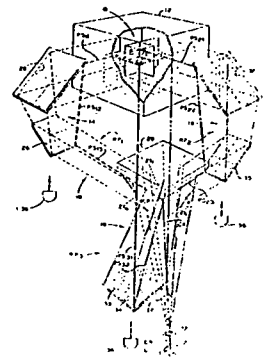

N81-17887* National Aeronautics and Space Administration. Pasadena Office, Calif.

DOUBLE-BEAM OPTICAL METHOD AND APPARATUS FOR MEASURING THERMAL DIFFUSIVITY AND OTHER MOLECULAR DYNAMIC PROCESSES IN UTILIZING THE TRANSIENT THERMAL LENS EFFECT Patent

Jovan Moacanin (JPL), Amitava Gupta (JPL), and Su-don Hong, inventors (to NASA) (JPL) Issued 6 Jan. 1981 11 p Filed 31 Jan. 1979 Supersedes N79-17683 (17-08, p 1052) (NASA-Case-NPO-14657-1; US-Patent-4,243,327; US-Patent-Appl-SN-008211; US-Patent-Class-356-432; US-Patent-Class-73-15R) Avail: US Patent and Trademark Office CSCL 20F

A sample material was irradiated by relatively high power, short pulses from a dye laser. Energy from the pulses was absorbed by the sample material, thereby forming a thermal lens in the area of absorption. The pulse repetition rate was chosen so that the thermal lens is substantially dissipated by the time the next pulse reaches the sample material. A probe light beam, which in a specific embodiment is a relatively low power, continuous wave (cw) laser beam, irradiated the thermal lens formed in the sample material. The intensity characteristics of the probe light beam subsequent to irradiation of the thermal lens is related to changes in the refractive index of the sample material as the thermal lens is formed and dissipated.

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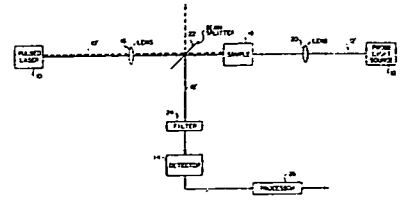

N81-17888* National Aeronautics and Space Administration. Pasadena Office, Calif.
INTERFEROMETER Patent
James B. Breckinridge, inventor (to NASA) (JPL) Issued 6 Jan. 1981 6 p Filed 30 Nov. 1978 Supersedes N79-19317 (17-10, p 1279) Sponsored by NASA
(NASA-Case-NPO-14502-1; US-Patent-4,243,323; US-Patent-Appl-SN-965368; US-Patent-Class-356-345; US-Patent-Class-356-352; US-Patent-Class-356-358) Avail: US Patent and Trademark Office CSCL 20F

An interferometer of relatively simple design which is tilt compensated, and which facilitates adjustment of the path lengths of split light beams is described. The interferometer includes a pair of plate-like elements with a dielectric coating and an oil film between them, that forms a beamsplitter interface, and with a pair of reflector surfaces at the ends of the plates. A pair of retroreflectors are positioned so that each split beam component is directed by a retroreflector onto one of the reflector surfaces and is then returned to the beamsplitter interface, so that the reflector surfaces tilt in a direction and amount that compensates for tilting of the beamsplitter interface.

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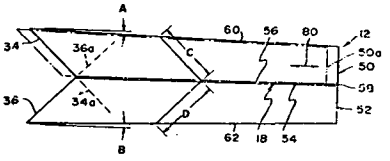

N81-19896* National Aeronautics and Space Administration. Pasadena Office, Calif.
SYSTEM AND METHOD FOR CHARACTER RECOGNITION Patent
Jung Pyo Hong, inventor (to NASA) (JPL, California Inst. of Tech., Pasadena) Issued 29 Oct. 1974 13 p Filed 31 Jul. 1972 Continuation-in-part of abandoned US Patent Appl. SN-090584, filed 18 Nov. 1970 Sponsored by NASA
(NASA-Case-NPO-11337-1; NASA-Case-NPO-11575-1; US-Patent-3,845,466; US-Patent-Appl-SN-276599; US-Patent-Appl-SN-090584; US-Patent-Class-340-146.3S; US-Patent-Class-340-146.3H; US-Patent-Class-340-146.3Y) Avail: US Patent and Trademark Office CSCL 20F

A character recognition system is disclosed in which each character in a retina, defining a scanning raster, is scanned with random lines uniformly distributed over the retina. For each type of character to be recognized the system stores a probability density function (PDF) of the random line intersection lengths and/or a PDF of the random line number of intersections. As an unknown character is scanned, the random line intersection lengths and/or the random line number of intersections are accumulated and based on a comparison with the prestored PDFs a classification of the unknown character is performed.

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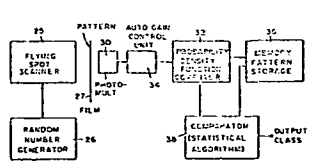

N81-19898* National Aeronautics and Space Administration. Pasadena Office, Calif.
X-RAY POSITION DETECTOR Patent
Gordon Garmire, inventor (to NASA) (JPL, California Inst. of Tech., Pasadena) Issued 28 Nov. 1972 4 p Filed 4 Dec. 1970
(NASA-Case-NPO-12087-1; US-Patent-3,704,284; US-Patent-Appl-SN-095217; US-Patent-Class-250-83.6R) Avail: US Patent and Trademark Office CSCL 20F

An X-ray position detector for real time operation is described. A set of proportional counters is arranged into an array which can detect and indicate the position of an X-ray interaction within the array, in the X Y plane.

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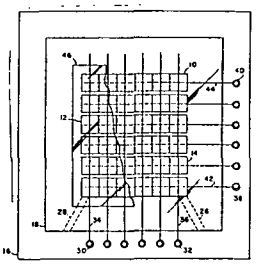
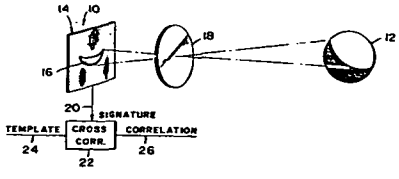


N81-19899*# National Aeronautics and Space Administration. Pasadena Office, Calif.
OPTICAL SIGNATURE GENERATING AND CORRELATING APPARATUS Patent Application
Robert W. Armstrong, inventor (to NASA) (JPL, California Inst. of Tech., Pasadena) Filed 10 Feb. 1981 21 p
(Contract NAS7-100)
(NASA-Case-NPO-15226-1; US-Patent-Appl-SN-233274) Avail: NTIS HC A02/MF A01 CSCL 20F

An image sensor of the charge coupled device (CCD) type is described which can automatically generate a signature, representing an optical image, to facilitate cross correlation with another image. A transfer detecting device is provided at an edge of each pixel of the array to detect the magnitude of the charge representing the light which fell on the pixel. A conductor is connected in parallel to all detecting devices of a row of pixels to generate an output representing the light falling on an entire row of pixels. Another group of transfer detecting devices is provided which can detect a second transfer of charges which were originally transferred out of the pixels. Each column of second transfer detecting devices is likewise connected to another conductor. The charge gathered by each conductor can be transferred directly to a cell of a CCD register of a cross correlating device. NASA



76 SOLID-STATE PHYSICS

Includes superconductivity.

For related information, see also *33 Electronics and Electrical Engineering* and *36 Lasers and Masers.*

N81-19944*# National Aeronautics and Space Administration. Pasadena Office, Calif.

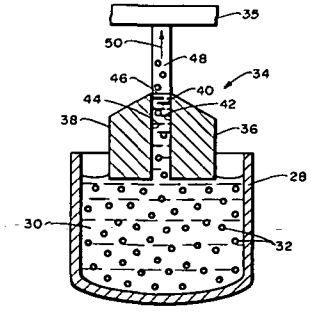
ELECTROMIGRATION PROCESS FOR THE PURIFICATION OF MOLTEN SILICON DURING CRYSTAL GROWTH Patent Application

Paul J. Shlichta, inventor (to NASA) (JPL, California Inst. of Tech., Pasadena) Filed 10 Feb. 1981 15 p

(Contract NAS7-100)

(NASA-Case-NPO-14831-1; US-Patent-Appl-SN-233269) Avail: NTIS HC A02/MF A01 CSCL 20B

A process for the purification of molten materials during crystal growth by electromigration of impurities to localized dirty zones has particular applications for silicon crystal growth according to Czochralski techniques and edge defined film fed growth (EFG) conditions. In the Czochralski crystal growing process, the impurities are electromigrated away from the crystallization interface by applying a direct electrical current to the molten silicon for electromigrating the charged impurities away from the crystal growth interface. In the EFG crystal growth process, a direct electrical current is applied between the two faces which are used in forming the molten silicon into a ribbon. The impurities are thereby migrated to one side only of the crystal ribbon. The impurities may be removed or left in place. If left in place, they will not adversly affect the ribbon when used in solar collectors. The migration of the impurity to one side only of the silicon ribbon is especially suitable for use with asymmetric dies which preferentially crystallize uncharged impurities along one side or face of the ribbon. NASA



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Section 1: Abstracts

16. Abstract

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